JANUARY, 1924

JAN 8 1924

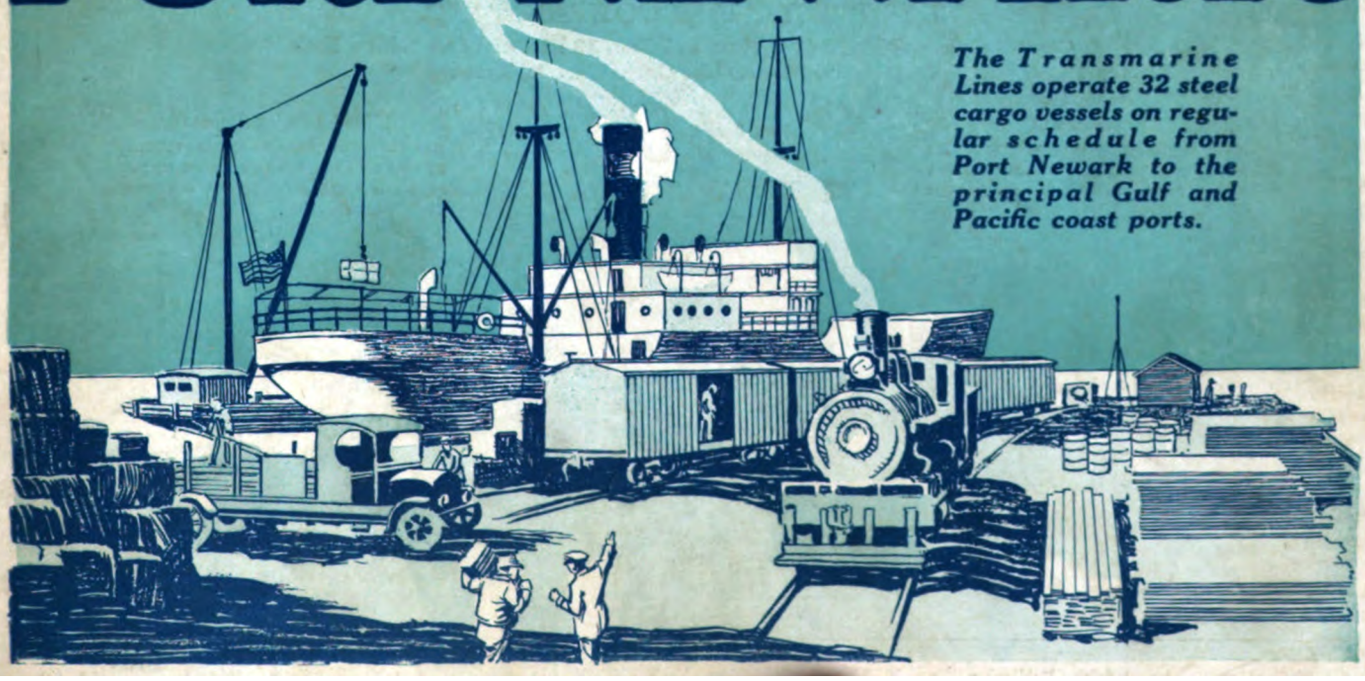
Marine Engineering

and Shipping Age

PORT NEWARK is the most highly developed seaport on the Atlantic Seaboard. It is the logical shipping and distributing center of the East. Write for interesting booklet.

THOS. L. RAYMOND
Director
Department of Public Improvements
NEWARK, NEW JERSEY

PORT NEWARK



The Transmarine Lines operate 32 steel cargo vessels on regular schedule from Port Newark to the principal Gulf and Pacific coast ports.

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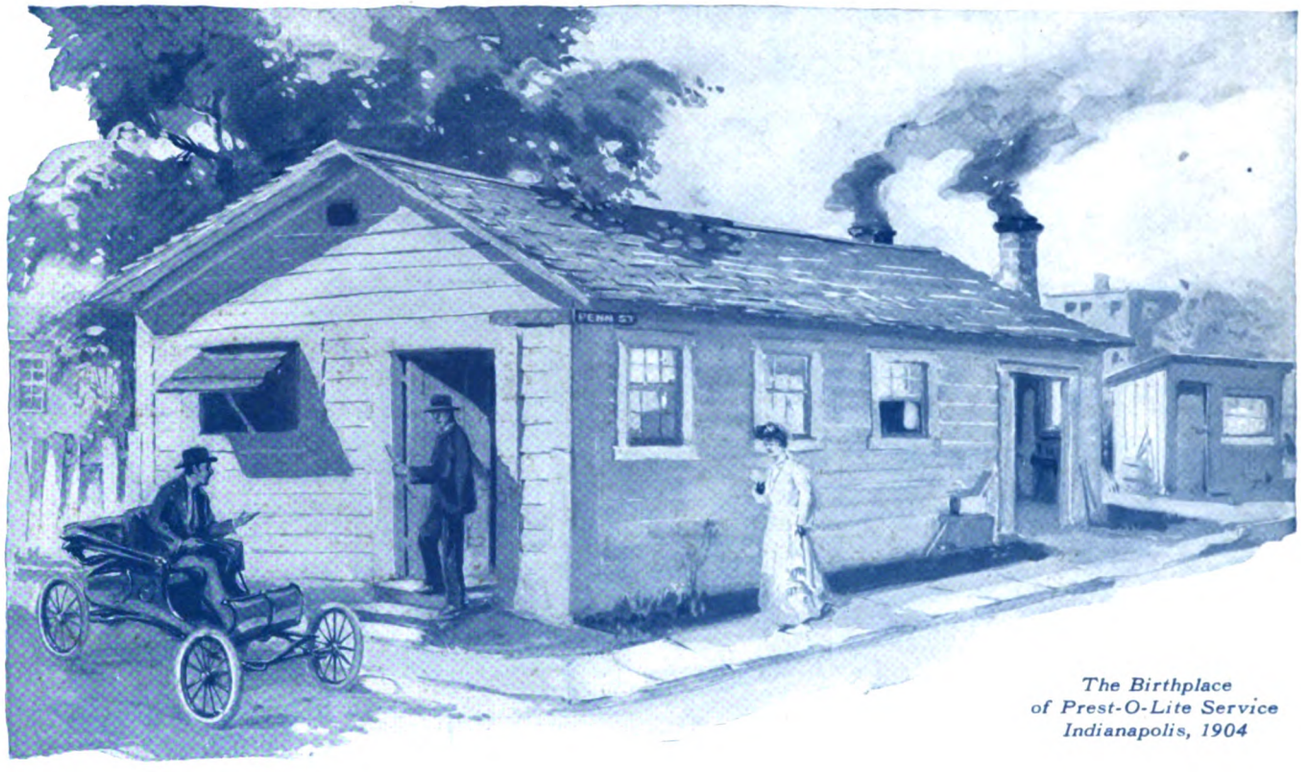

The Birthplace of Prest-O-Lite Service Indianapolis, 1904

Prest-O-Lite pioneered for you

PREST-O-LITE was the first to conceive and put into operation the idea of a nation-wide chain of service stations.

When the Oxy-Acetylene Process made its entry into American factories, Prest-O-Lite Service was already a household expression.

Today, 28 plants and 44 warehouses supply this one universally used gas for both welding and cutting in convenient portable form. And 1924 will see further additions to Prest-O-Lite facilities.

Prest-O-Lite Dissolved Acetylene meets every demand for an economical, safe, portable fuel gas for welding and cutting. Prest-O-Lite Service meets every demand for a dependable supply anywhere, any time.

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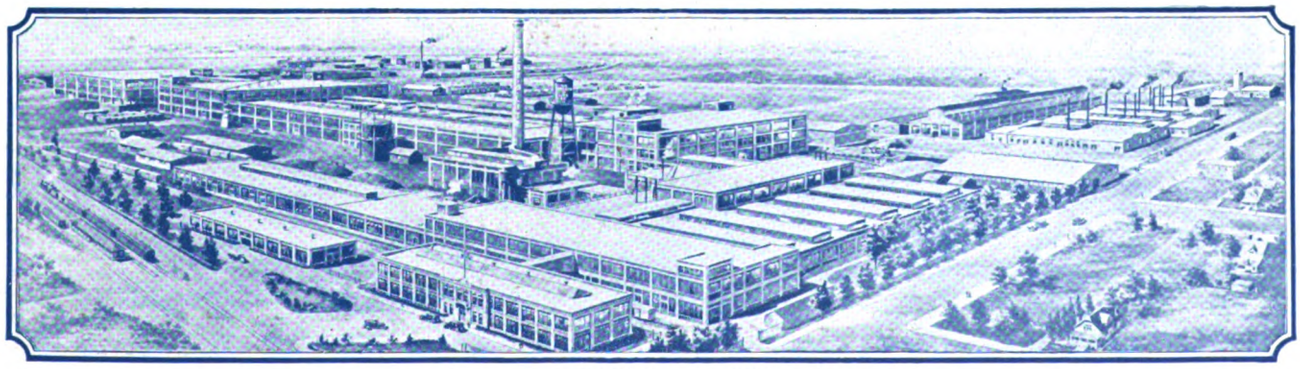

TWENTY YEARS AFTER

Vol. XXIX No. 1

Published Monthly by Aldrich Publishing Co 30 Church St., New York, N. Y. Subscri St., New York, N. Y., in conjunction with Simmons-Boardman Publishing Co., States, Mexico and Canada, $3.00; foreign, $4.00 a year, single copy 35 cents. Entered as second-class matte the New York Post Office, under the act of March 3, 1879.

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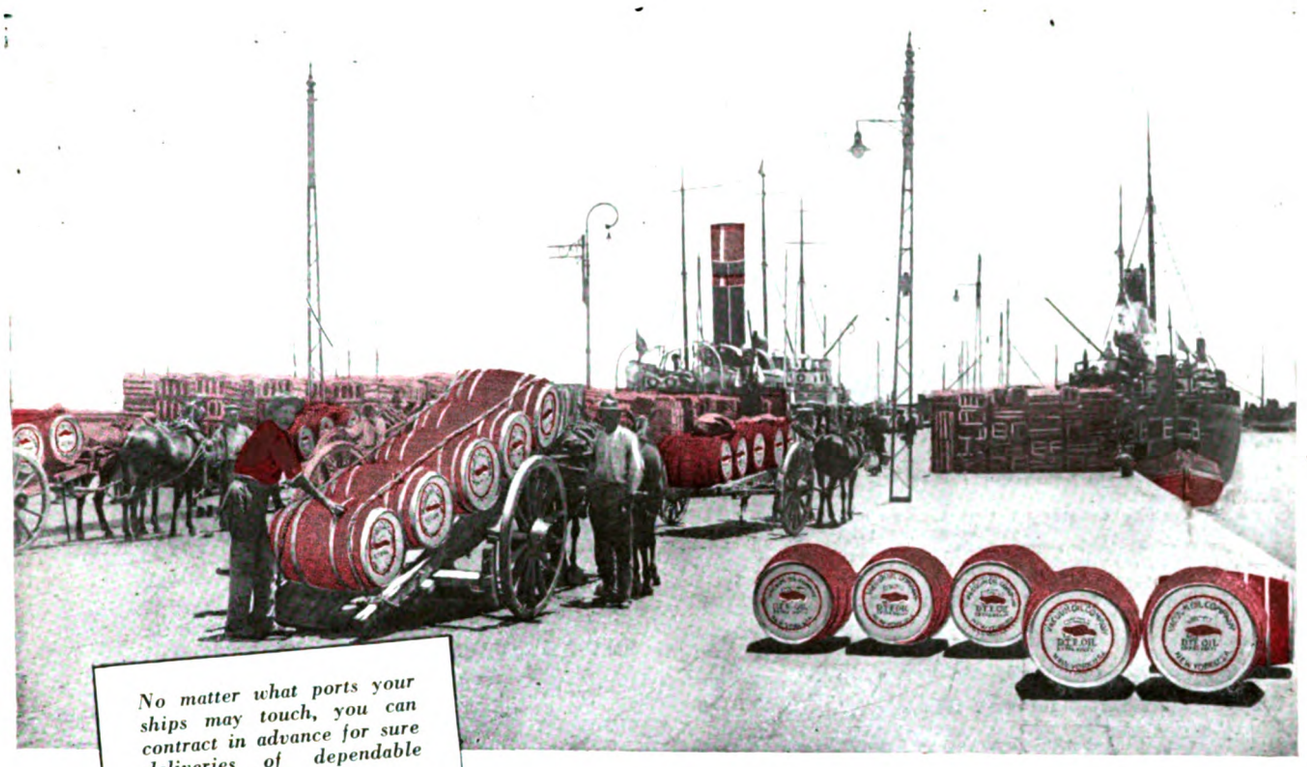

No matter what ports your ships may touch, you can contract in advance for sure deliveries of dependable Gargoyle Marine Oils.

How to really save money on lubrication

HERE and there some steamship executive—usually a new-comer on the line—will advocate "cheap" oils for his fleet. If he could talk with the countless marine engineers who know the economy of using Gargoyle Marine Oils, he would reverse his decision before it is too late.

The purpose of a lubricating oil is to keep a marine engine running—with no stops at sea for makeshift repairs, with no delays in foreign ports for replacement parts, and with minimum annual depreciation of machinery.

It is for this purpose that we manufacture Gargoyle Marine Oils and distribute them to the world's shipping. These high-quality oils are of the richest lubricating values and come in scientifically correct grades for every marine engine and machine.

To those who prefer to take a chance with low quality lubrication, bought "cheap," we can only sound a friendly warning based on half a century's experience.

It is far more difficult to manufacture a high-grade oil which will effect economy in the operation of marine engines than to make a cheap oil to sell at a price. We follow the former course, and after you have used Gargoyle Marine Oils for a voyage or two, we are confident you will approve of it.

When wanted, and where wanted, at any port, at any date, Gargoyle Marine Oils of the correct grades will be delivered under contract between the Vacuum Oil Company and your head office.

GARGOYLE

Marine Oils

'A grade for each type of service'

VACUUM OIL COMPANY *Specialists in the manufacture of high-grade lubricants for every class of machinery. Obtainable everywhere in the world.* **NEW YORK, U.S.A.**

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FEBRUARY, 1924

Marine Engineering and Shipping Age

PORT NEWARK with its remarkable rail connections, its deep water shipping facilities, and its location within the Harbor of New York, is the most desirable shipping, distributing, and manufacturing center in the East.

Write for FREE copy of "Port Newark," the book that tells all about this wonderful development and its surrounding territory.

THOS. L. RAYMOND,
Director

Department of Public Improvements

Newark - - New Jersey

Transmerine Line Steamers leave Port Newark on regular schedule for Gulf and Pacific Coast Ports.

PORT NEWARK

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To meet your needs

EVERY other working day during 1923, Prest-O-Lite's big cylinder factory in Indianapolis poured a carload of new cylinders into the service of Prest-O-Lite users.

This is striking proof of the important part Prest-O-Lite service plays in expanding the use of the Oxy-Acetylene process.

Every resource is being developed to meet the fast-growing demand for Prest-O-Lite Dissolved Acetylene.

THE PREST-O-LITE COMPANY, INC.

General Offices: Carbide & Carbon Building, 30 East 42d Street, New York

In Canada: Prest-O-Lite Co. of Canada, Toronto

District Sales Offices

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Vol. XXIX **No. 2**

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LOOK TWICE
at your oil bills

Have you counted in the hidden dangers?

No matter what ports your ships may touch, you can contract in advance for sure deliveries of dependable Gargoyle Marine Oils.

IN the past half century, we have frequently warned shipping interests of the dangers of purchasing lubricating oils on a "penny wise" basis.

Cheap oils, low in lubricating qualities, look economical on paper. Inevitably the true bill comes in later,—in the shape of more frequent orders for the low grade oil, less protection to the machinery it was supposed to lubricate, more waste of horsepower and more repairs at sea.

Unless the damage done by low grade, "cheap" oils has gone too far, Gargoyle Marine Oils will produce immediate operating economies for any line using any type of marine engine.

Drop for drop these high-quality oils are incomparably richer in lubricating values. You will find their slightly added cost a small item of expense compared with the dependable, economical service they give.

Due to the wide demand for these economical lubricants, we have made it convenient for you to secure immediate deliveries of Gargoyle Marine Oils in any one of the hundreds of ports where your ships may touch. This obviates the need for carrying a large store of oils per voyage. Economy of time and space is thus added to economy of operation.

If you are not already using Gargoyle Marine Oils, we shall be glad to give you the testimony of users here and abroad. You can then form your own judgment on the economy of these high-grade lubricants in actual use.

GARGOYLE

Marine Oils

A grade for each type of service

VACUUM OIL COMPANY — *Specialists in the manufacture of high-grade lubricants for every class of machinery. Obtainable everywhere in the world.* — NEW YORK, U.S.A.

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MARCH, 1924

Marine Engineering and Shipping Age

AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO CHESTER, PA.

The Largest Anchor in the World

THIS Dunn Stockless Anchor was constructed by the Thurlow Works of the American Steel Foundries at Chester, Pennsylvania, for the "S.S. Leviathan" of the United States shipping board lines. The weight of the anchor is 33,300 lbs.

DUNN STOCKLESS ANCHORS

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From a ship builder—

"I cannot let this pass without commendation

"Your special trip at an inconvenient time meant an important repair job completed without delay.

"We have always been entirely satisfied with your service and your product."

THE PREST-O-LITE COMPANY, INC.

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Prest-O-Lite
Pioneer in Service

Vol. XXIX **No. 3**

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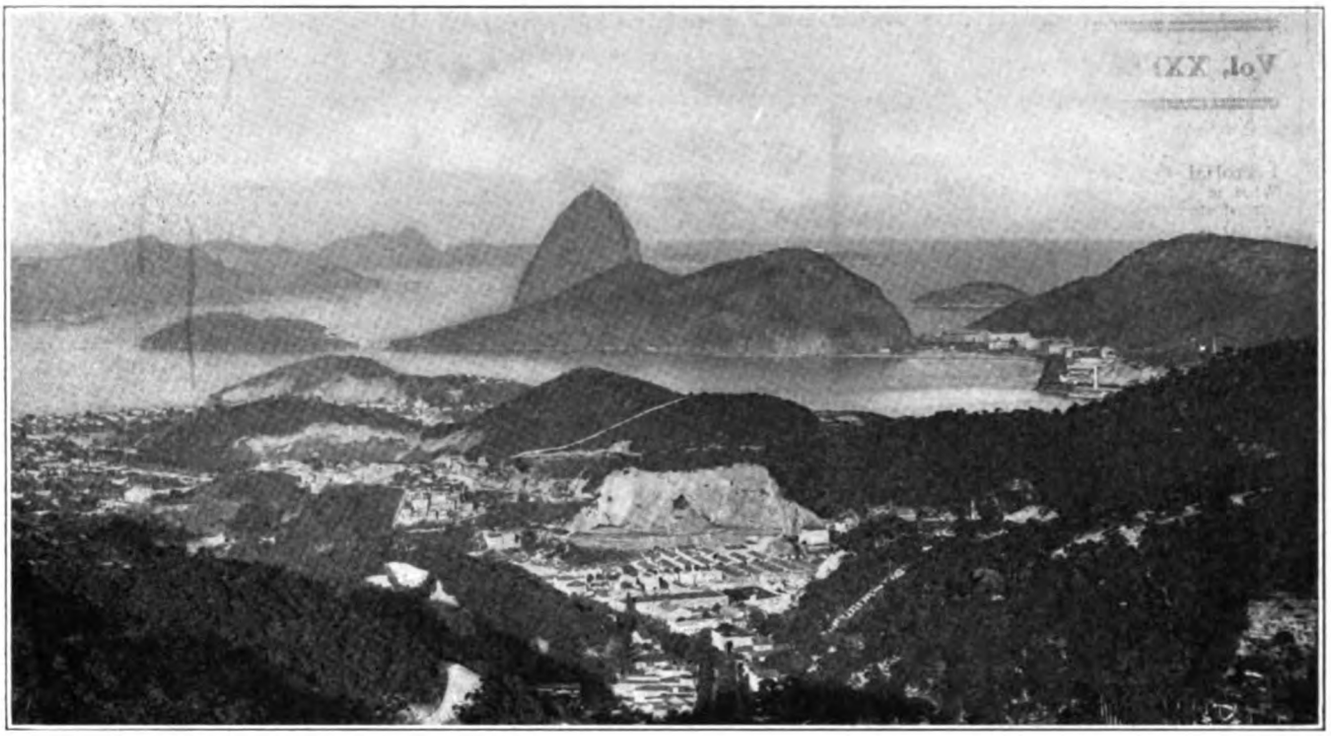
THE HARBOR AT "RIO"

No matter what ports your ships may touch, you can contract in advance for deliveries of Gargoyle Marine Oils.



The Mistaken Economy
of low-cost Marine Oils

IN a recent issue of a prominent marine publication appeared the following statement:

"The cost of poor marine lubrication is disastrous. An attempt to economize on the first cost of lubricating oil is about the most expensive mistake in which an operator can indulge. It is a fuel waster, a speed destroyer, a booster of repair bills and a loser of profits."

These are facts. Can you afford to overlook the long-run economy of correct and adequate lubrication?

The use of the grades of Gargoyle Marine Oils which meet exactly the requirements of your particular engines, you will find, not only enables you to secure the greatest power and efficiency at minimum cost—but, too, helps to forestall breakdowns, delays at sea and costly repairs and replacements.

Let the Vacuum Oil Company representative explain to you the advantages of the Gargoyle Marine Oil Agreement by which you can contract in advance for oil deliveries in over 250 ports of the world.

GARGOYLE

Marine Oils
A grade for each type of service

What the Gargoyle Marine Oil Agreement
means to ship owners all over the world

Through its "memorandum of agreement," the Vacuum Oil Company offers you an economical and effective plan for the correct lubrication of your fleet as a unit.

First Step:

Our representatives confer with you on the lubrication needs of your individual ships. The oils which we recommend will be scientifically correct for each engine and machine.

Second Step:

We prepare an agreement with you, under which we will contract to deliver the required oil when and where wanted—at any port, at any date.

By this fleet-plan of lubrication, doubt and uncertainty as to quality of lubrication are done away with. Uncertain deliveries are guarded against. All the financing of your entire supply of oil is taken care of through your head office.

Our representative will be glad to give you further details.

VACUUM OIL COMPANY *Specialists in the manufacture of high-grade lubricants for every class of machinery. Obtainable everywhere in the world.* **NEW YORK, U.S.A.**

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APR 5 1924

APRIL, 1924

Marine Engineering and Shipping Age

No. 4387 horizontal back pressure valve
No 4382 extra heavy chronometer valve
No. 4450 standard hose gate valve
No. 4625 – A extra heavy cross valve
No. 1137 steam and water relief valve
No. 4551 standard globe screw-down check valve
No. 5435 low pressure composition gate valve

Crane supplies marine valves for any pressure

CRANE

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CRANE LIMITED, 386 BEAVER HALL SQUARE, MONTREAL, QUEBEC

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TWENTY-EIGHT PLANTS and forty-four warehouses supply Prest-O-Lite dissolved acetylene in convenient portable form for oxy-acetylene welding and cutting.
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Prest-O-Lite batteries for your cars and Prest-O-Lite small tanks for your trucks are supplied by your Prest-O-Lite Battery Service Station.
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Pioneer in Service

Vol. XXIX **No. 4**

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AT MELBOURNE—No matter what ports your ships may touch, you can contract in advance for deliveries of Gargoyle Marine Oils.

Why not charge Repairs against Lubricating Oil Expense?

SUPPOSE your ship comes limping into port. After she's tied up at the dock, the engine-room crew gets down to work. Perhaps the oil film has broken down under service. This may result in all sorts of trouble—it may mean bearings to be replaced, cylinders rebored, or new valves. It may even mean the replacing of gears.

Result? A sailing may be delayed, with the cost of holding the ship in port. New parts may be needed—*additional expense.*

To what account will you charge all this? Probably to general operating expenses—lumped in with other costs. So the real cause and the real point where economies may be effected are lost sight of.

Repairs that are the result of the use of a cheap or an improper lubricant should be charged with the original cost of that product.

Far-seeing operators, captains and engineers have found that the correct grade of Gargoyle Marine Oils will

—help to forestall breakdowns, delays and costly repairs;
—enable them to get greatest power, speed and efficiency from their engines at minimum cost.

The Vacuum Oil Company representative can tell you how these high-grade oils will effect operating economies for *you*. He will, too, explain the Gargoyle Marine Oil agreement under which you can contract in advance for oil deliveries in over 300 world ports.

GARGOYLE

Marine Oils

A grade for each type of service

What the Gargoyle Marine Oil Agreement means to Ship Owners all over the World

Through its "memorandum of agreement," the Vacuum Oil Company offers you an economical and effective plan for the correct lubrication of your fleet as a unit.

First Step:

Our representatives confer with you on the lubrication needs of your individual ships. The oils which we recommend will be scientifically correct for each engine and machine.

Second Step:

We prepare an agreement with you, under which we will contract to deliver the required oil when and where wanted—at any port, at any date.

By this fleet-plan of lubrication, doubt and uncertainty as to quality of lubrication are done away with. Uncertain deliveries are guarded against. All the financing of your entire supply of oil is taken care of through your head office.

Our representative will be glad to give you further details.

VACUUM OIL COMPANY *Specialists in the manufacture of high-grade lubricants for every class of machinery. Obtainable everywhere in the world.* NEW YORK, U.S.A.

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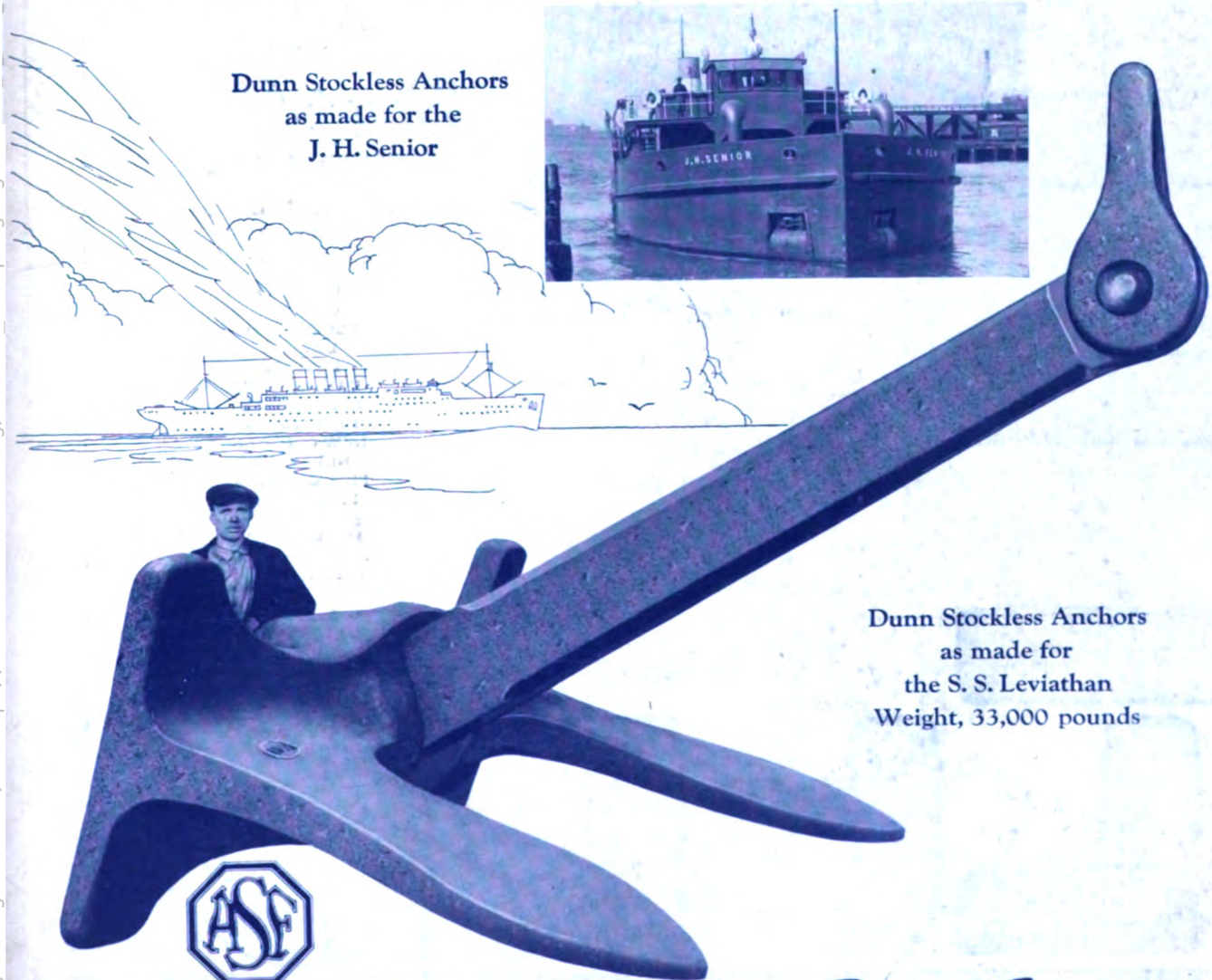
MAY, 1924

Marine Engineering and Shipping Age

AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO CHESTER, PA.

Dunn Stockless Anchors
as made for the
J. H. Senior



Dunn Stockless Anchors
as made for
the S. S. Leviathan
Weight, 33,000 pounds

Dunn Stockless Anchors

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THE CAR SERVICE department of the New York Central Railroad maintains a record of the whereabouts of 135,616 company-owned freight cars. Similarly, Prest-O-Lite records the movement of many more cylinders in and out of its 72 plants and warehouses. Keeping these cylinders moving is just as important to the Prest-O-Lite user as car movement is to the shipper.
THE PREST-O-LITE COMPANY INC.
General Offices: Carbide & Carbon Building 30 East 42d Street, New York
In Canada: Prest-O-Lite Co. of Canada, Ltd. Toronto
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PHILADELPHIA
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ST. LOUIS
SALT LAKE CITY
SAN FRANCISCO
SEATTLE
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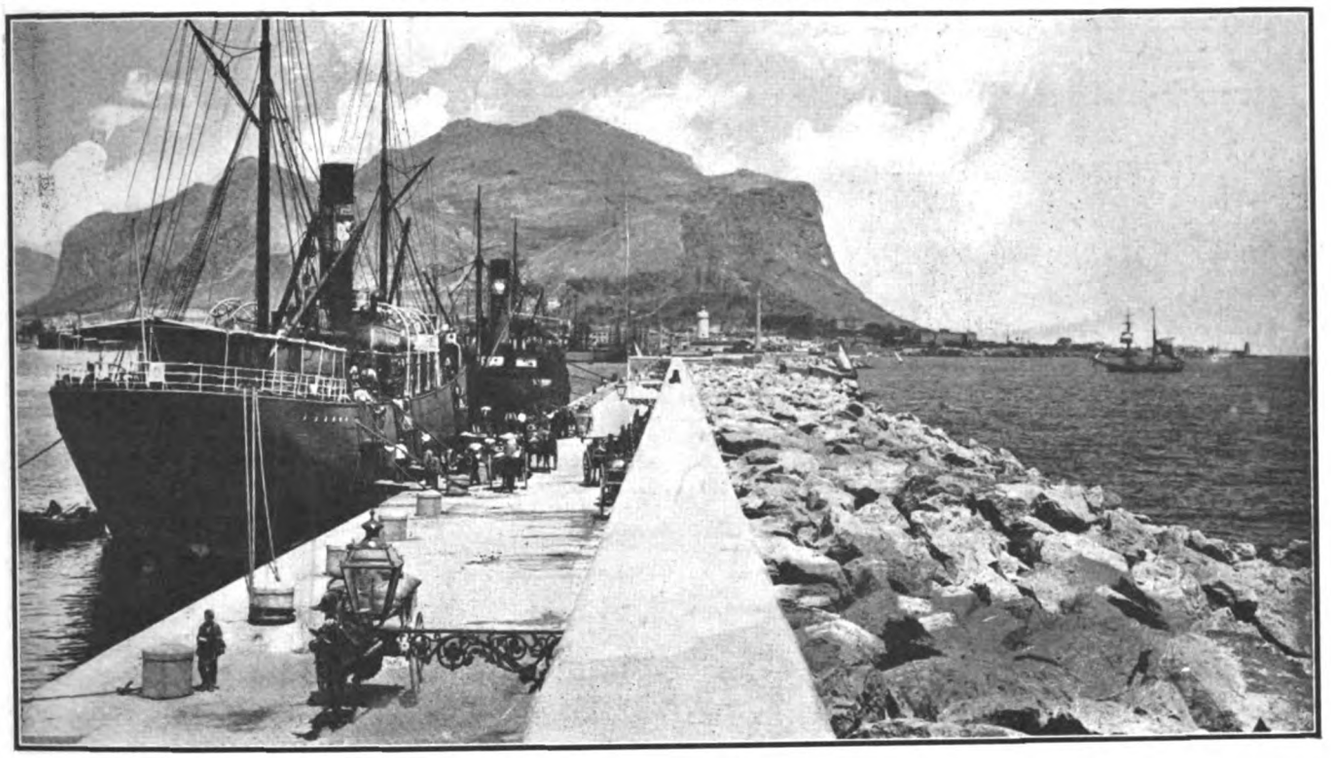
PALERMO, SICILY. No matter what ports your ships may touch, you can contract in advance for deliveries of Gargoyle Marine Oils.



4 major operating economies

THERE is one outstanding reason why Gargoyle Marine Oils are in use on ships hailing from every port in the world.

The reason is this:

Ship owners in every maritime country have found that these high-grade oils produce 4 major economies which it is folly to pass up. These proven economies are—

—economy of fuel
—economy of oil
—savings in repair costs
—less engine depreciation

Owners, Captains and Engineers who have never used Gargoyle Marine Oils sometimes object to their slightly higher initial cost. There is no economy in cheap oils. A few cents saved in the purchase price may cost many dollars in operating expense. Our 50 years' experience has shown us that inferior oils do not and cannot produce permanent economies.

By signing a Gargoyle Contract, you will have the best possible assurance that your ships will be correctly and economically lubricated. Also, the convenience of having your lubricants ready for delivery at any port in the world is a point worth keeping in mind. We shall be glad to have an experienced representative explain in detail what we can do for you. If you are interested, kindly address your letter to our head office in New York.

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JUNE, 1924

JUN 9 1924

Marine Engineering and Shipping Age

WORTHINGTON

S. S. Leviathan Boston Dry Dock
Both Worthington Equipped

Below is shown the S.S. Leviathan in the great Boston Dry Dock. The Dry Dock is emptied by Worthington Pumps, while on the Leviathan Worthington Diesel Engines drive auxiliary generators.

WORTHINGTON PUMP AND MACHINERY CORPORATION

Executive Offices: 115 Broadway, New York City. Branch Offices in 24 Large Cities.

WORTHINGTON

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PREST-O-LITE has its own cylinder factory in Indianapolis. Every other working day last year, this factory poured a carload of new cylinders into the service of Prest-O-Lite users, thus demonstrating the important part Prest-O-Lite service plays in the expanding use of the oxy-acetylene process.
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CHICAGO
CLEVELAND
DALLAS
DETROIT
KANSAS CITY
LOS ANGELES
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DISSOLVED ACETYLENE

Vol. XXIX No. 6

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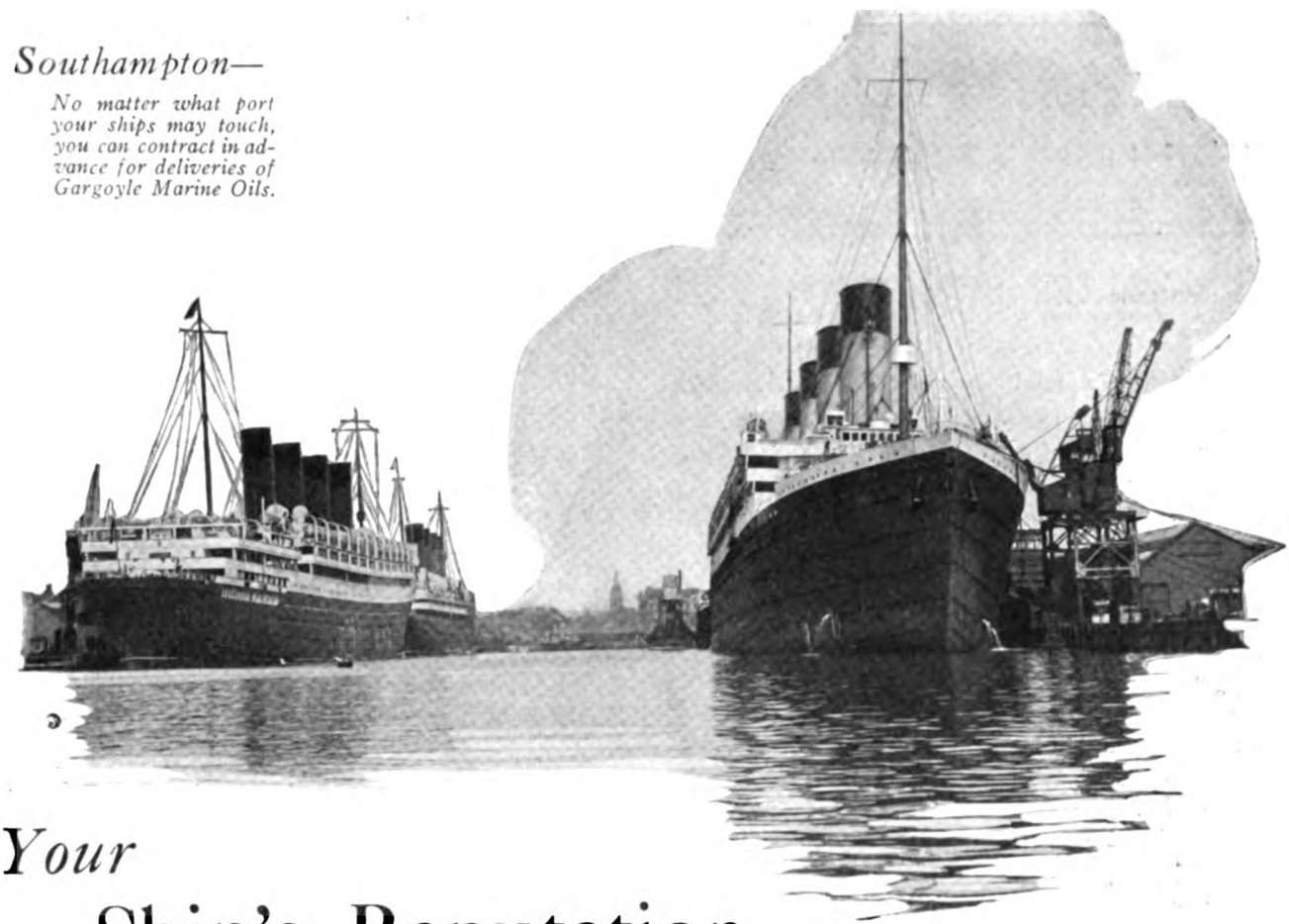
Southampton—

No matter what port your ships may touch, you can contract in advance for deliveries of Gargoyle Marine Oils.



Your Ship's Reputation

NO matter what the size of your ships, passengers and freight increase as your reputation for reliability of service and operation increases.

Step into the engine-room of any ship having a reputation for dependability and you will find the engineer proud of his engines and careful to the point of fussiness about their lubrication.

It is no accident that more Gargoyle Marine Oils are used by the world's shipping than any other single brand. That fact is due to the painstaking care with which these high-grade oils are manufactured by the Vacuum Oil Company. It is due to the scientific accuracy with which they are prescribed for individual engine requirements. It is due to the following results in use:

—less friction
—fewer repairs and replacements
—savings in horsepower
—savings in oil consumption brought about by the superior lubricating characteristics in the oils themselves.

Gargoyle Marine Oils have as enviable a reputation for reliability as the ships that use them.

Gargoyle Marine Oils, correct for the particular requirements of your types of engines, may be had in more than 300 ports throughout the world. See column at right.

GARGOYLE

Marine Oils

A grade for each type of service

What the

Gargoyle Marine Oil Agreement

means to Ship Owners all over the World

Through its "memorandum of agreement," the Vacuum Oil Company offers you an economical and effective plan for the correct lubrication of your fleet as a unit.

First Step:

Our representatives confer with you on the lubrication needs of your individual ships. The oils which we recommend will be scientifically correct for each engine and machine.

Second Step:

We prepare an agreement with you, under which we will contract to deliver the required oil when and where wanted—at any port at any date.

By this fleet-plan of lubrication, doubt and uncertainty as to quality of lubrication are done away with. Uncertain deliveries are guarded against. All the financing of your entire supply of oil is taken care of through your head office.

Our representative will be glad to give you further details.

VACUUM OIL COMPANY *Specialists in the manufacture of high-grade lubricants for every class of machinery Obtainable everywhere in the world.* **NEW YORK, U.S.A.**

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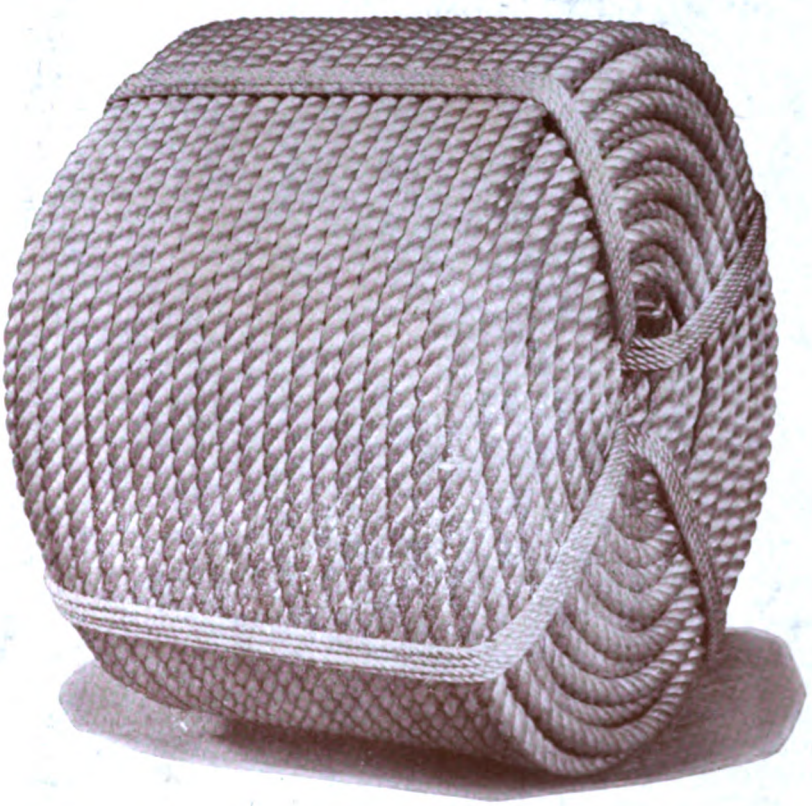
JULY, 1924

Marine Engineering and Shipping Age



A Coil of Columbian

looks like full value and is full value. Compare a coil of Columbian *Tape-Marked* Pure Manila Rope with ordinary Rope and the difference in value is apparent.

The red, white and blue *Tape-Marker*, Columbian's well known Guarantee, is positive assurance that the user will receive full value of service, for the manufacturer backs his product to the limit.

Take some Columbian *Tape-Marked* Rope on board and use it. You will then realize what is meant by "difference in value."

Write us for information regarding *Tape-Marked* Rope for Marine use.

By Invitation Member
Emblem of BUSINESS CHARACTER
Rice Leaders of the World Association
Represents High Standing in NAME-PRODUCT-POLICY

Columbian Rope Company

372-90 Genesee Street

Auburn, "*The Cordage City*," N. Y.

Branches:— New York Chicago Boston New Orleans

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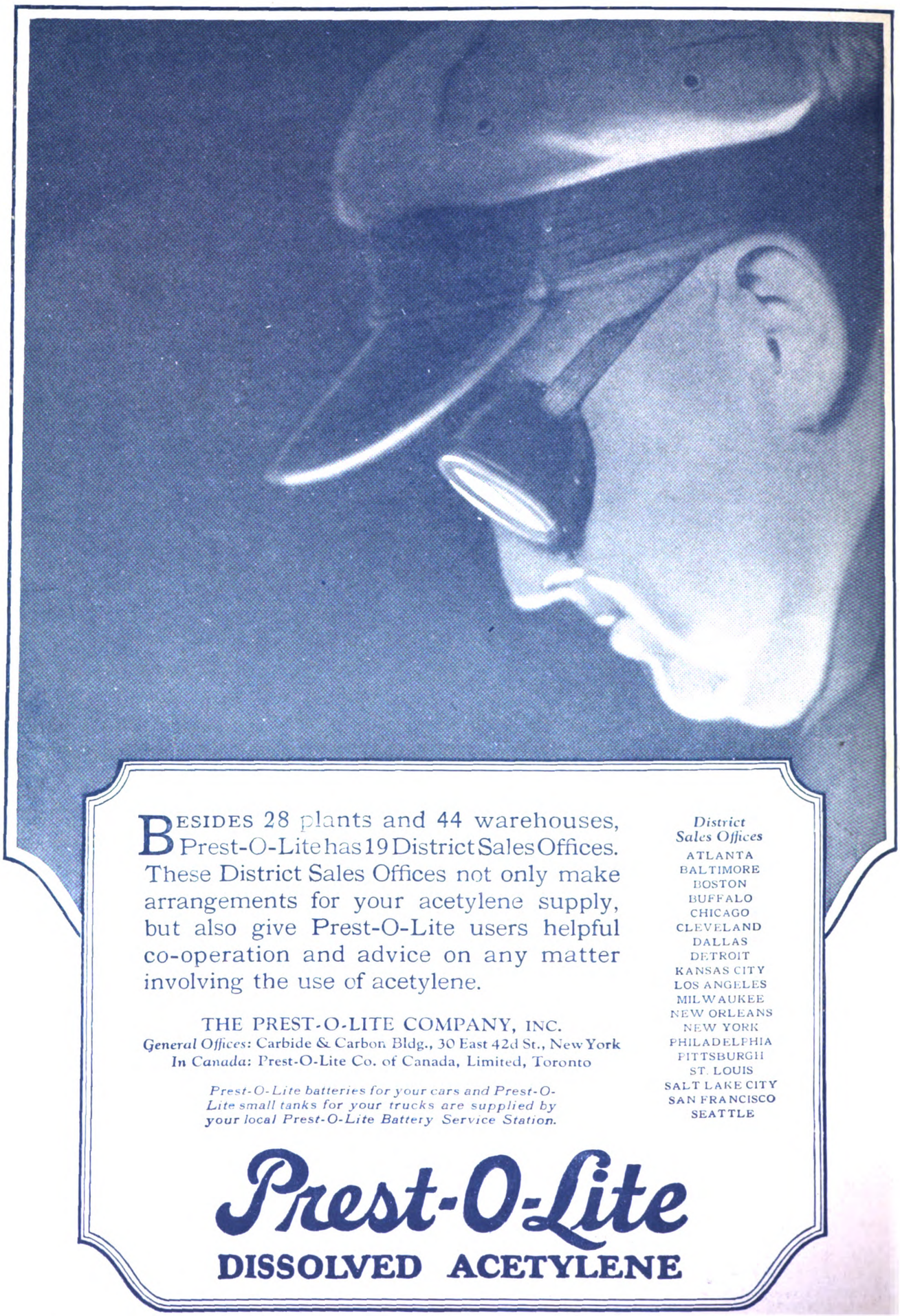

BESIDES 28 plants and 44 warehouses, Prest-O-Lite has 19 District Sales Offices. These District Sales Offices not only make arrangements for your acetylene supply, but also give Prest-O-Lite users helpful co-operation and advice on any matter involving the use of acetylene.

THE PREST-O-LITE COMPANY, INC.
General Offices: Carbide & Carbon Bldg., 30 East 42d St., New York
In Canada: Prest-O-Lite Co. of Canada, Limited, Toronto

Prest-O-Lite batteries for your cars and Prest-O-Lite small tanks for your trucks are supplied by your local Prest-O-Lite Battery Service Station.

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BALTIMORE
BOSTON
BUFFALO
CHICAGO
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NEW ORLEANS
NEW YORK
PHILADELPHIA
PITTSBURGH
ST. LOUIS
SALT LAKE CITY
SAN FRANCISCO
SEATTLE

Prest-O-Lite
DISSOLVED ACETYLENE

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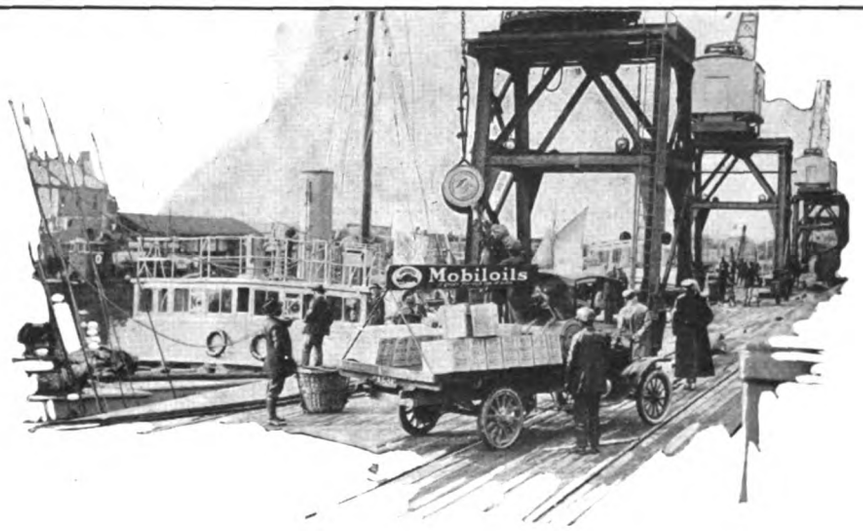
CAPE TOWN, S. A.—No matter what ports your ships may touch, you can contract in advance for deliveries of Gargoyle Marine Oils.



How to cut down delays in port

SHIP owners get many reports of delays. But no Captain or Engineer whose engines are lubricated with Gargoyle Marine Oils needs to be delayed because of the failure of prompt deliveries. He runs no risk of having to purchase a low-grade or incorrect oil in a foreign port. He eliminates the risk of delay by contracting in advance for deliveries where and when wanted.

The Vacuum Oil Company's world-wide organization takes care of this important work for him—and will take care of it for *you*. Gargoyle Marine Oils are carried in ample stocks in all maritime cities. Gargoyle representatives are at your service in more than 300 of the world's leading ports.

It has taken more than half a century to build up this great distributing organization. Ship owners, captains and engineers who want correct lubrication and want it promptly no matter where their ships may touch, are invited to communicate with us. See details of marine agreement in column at right.

GARGOYLE

Marine Oils

A grade for each type of service

What the Gargoyle Marine Oil Agreement means to Ship Owners all over the World

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PITTSBURGH
ST. LOUIS
SALT LAKE CITY
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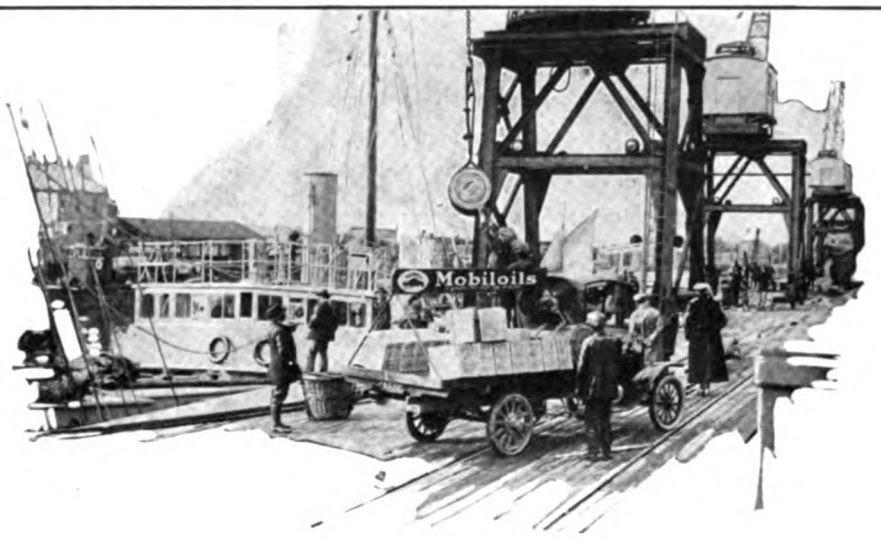

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AUGUST, 1924

Marine Engineering and Shipping Age

ROLL CALL
OF SHIPS CARRYING
"NACO" ANCHOR CHAIN CABLE

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AMBRIDGE
AMERICAN PRESS
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ARTIGAS

BAKERSFIELD
BAVINGTON
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BELLEMINA
BELLEPLINA
BELLEROSE
BELLFORT
BELLHAVEN
BENSON FORD
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BIENVILLE
BIRD CITY
BLAIR
BLUE TRIANGLE
BRUSH
BUFFINGTON

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CAPULIN
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CARLTON
CARPLACA
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CASEY
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COLLINGSWORTH
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CONEHATTA
CONEJOS
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CARLAER
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HOG ISLAND
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LIBERTY MINQUAS
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LORRAINE CROSS
LUXPALILI

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MAIDEN CREEK
MANATAWNY
MINNEQUA
MITCHELL
MOFFETT
MONROE
MONTAGUE
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NEDMAC
NOBLES

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PALO ALTO
PEEKSKILL
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PORTOLA PLUMAS
POUGHKEEPSIE

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SALEM COUNTY
SALUDA
SALVATION LASS
SANGAMON
SAN PASQUAL
SAPINERO
SARCOXIE
SATARTIA
SAUCON
SAUGERTIES
SAUGUS
SCANTIC
SCHENECTADY
SCHAUME
SCHODACK
SCHOHARIE
SCHOODIC
SCHWAB, CHAS. M.
SEEKONK
SELMA
SHAMROCK
SHICKSHINNY
SILETZ
SINSINAWA
STEEL AGE
STEEL MOTOR
STEEL NAVIGATOR
STEEL VENDOR
STEEL WORKER
SUNDANCE

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U. S. S. V3

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VINCENT

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WALDEN
WARNER, C. H.
WATERBURY
WAUKEGON
WEST CADDOA
WEST CADRON
WEST CAHOKIA
WEST CALERA
WEST CAMAK
WEST CAMPGAW
WEST CELINA
WEST CHAPOKA
WEST CHATALA
WEST CHESWALD
WEST FARALON
WEST GREYLOCK
WEST HARTLAND
WEST HARTLEY
WEST HARTS
WEST HASSAYAMPA
WEST HIKA
WEST HIMROD
WEST HIXTON
WEST HOLBROOK
WEST INSKIP
WEST IRMO
WEST ISLAY
WEST ISLETA
WEST ISLIP
WEST ISON
WEST KADER
WEST KASSON
WEST KATAN
WEST KEATS
WEST KEENE
WEST LEWARK
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WEST NOSSKA
WEST NOTUS
WEST POCASSET
WEST PROSPECT
WEST RARITANS
WEST SEGOVIA
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WILPEN
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NATIONAL MALLEABLE AND STEEL CASTINGS CO.

10600 QUINCY AVE. CLEVELAND, O.

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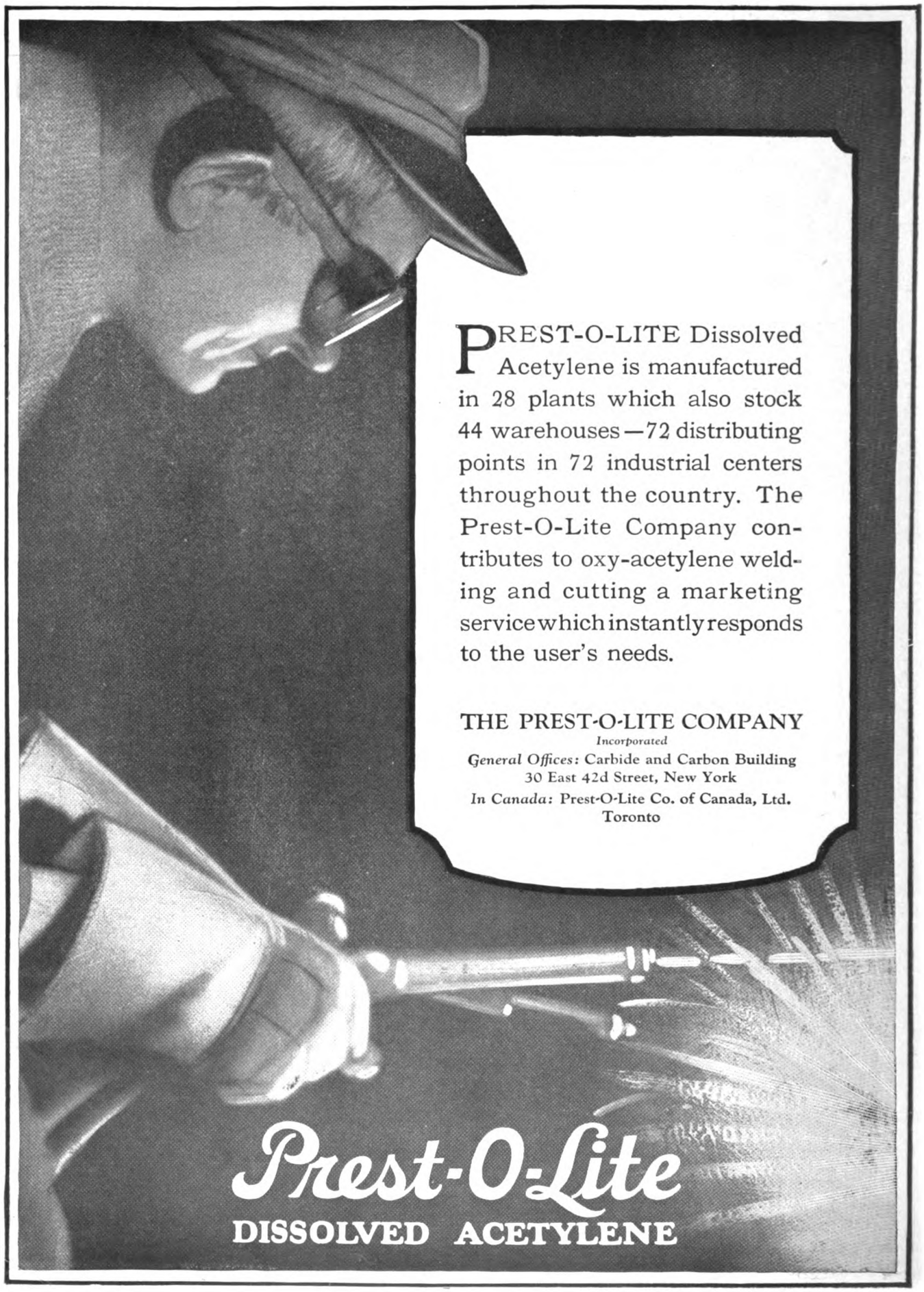
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VICTORIA, Vancouver. No matter what ports your ships may touch, you can contract in advance for deliveries of Gargoyle Marine Oils.

Ships that stay young

EVERY ship represents a large capital investment. The returns on that investment depend on its earning power over a period of years. The slower the rate of depreciation of the engine, the more profitable becomes the investment.

The Vacuum Oil Company can show you how scientifically correct lubrication will lengthen the life of marine engines. Are you interested?

Lubrication, as produced by the Vacuum Oil Company, has become an almost exact science.

We are prepared to prescribe with scientific accuracy the oils that your marine engine should use to prevent wear and consequent repairs and deterioration. We shall be glad to demonstrate our ability, based on 58 years' experience in the manufacture and application of high-grade lubricants.

Why not talk this over with a Vacuum Oil Company representative? He will point out ways of protecting your investment that may be quite new to you. In writing, kindly address our New York office.

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SEPTEMBER, 1924

Marine Engineering and Shipping Age

Engineering
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ANY VALVE
OR FITTING
FOR ANY SHIP

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by the General Electric Company, Schenectady, N. Y. Illustrations are given of the various type fans produced by the G. E. Company.

Bearing Metals.—The Magnolia Metal Bearing Book, containing a discussion of Magnolia anti-friction metal together with simple practical instructions for the making and operation of lined bearings for efficient and economical service, has been published and is now being sold by the Magnolia Metal Company, 113-115 Bank street, New York.

Welding Equipment.—A new 48-page catalogue, illustrating and describing in detail the complete line of acetylene generators and oxy-acetylene welding, cutting, brazing, lead burning, heating and decarbonizing equipment manufactured by the Oxweld Acetylene Company, Long Island City, N. Y., is now available for distribution to all those interested in the subject of gas welding.

Electric Welding of Large Storage Tanks.—A reprint of a paper read by Harold C. Price, presented before the American Institute of Mining and Metallurgical Engineers at the New York meeting in February, 1924, on the subject of "Electric Welding of Large Storage Tanks," has been sent out by the Wilson Welder & Metals Company, Inc., Hoboken Factory Terminal, Hoboken, N. J.

Heavy Oil Engines.—Bulletin 32 prepared by the Bethlehem Shipbuilding Corporation, Ltd., Bethlehem, Pa., discusses the Bethlehem-Trout heavy oil engine, its advantages and application, together with specifications of the engines, which are available in units from 75 to 480 horsepower direct drive for marine service and from 50 to 480 horsepower in generator drive for stationary service.

Fuel Oil Burning.—The text-book employed by the Todd Oil Burning School, conducted by the Todd Shipyards Corporation, New York, has been made available to all those who are interested in the matter and will send a request for it. This book gives data on fuel oil and its characteristics, the chemistry of combustion and specific instructions regarding the operation of oil burning equipment.

Galley and Pantry Equipment.—Elisha Webb & Son Company, 136 South Front street, Philadelphia, manufacturers of galley ranges, bake ovens, broilers, steam cookers, jacket kettles, coffee and tea urns, steam tables and cooking apparatus of special design for steamships, yachts, tugs and vessels of every description are specifically described and listed in a bulletin now availabe on a request to the company.

Heine Boilers.—Under the title of "In the Footsteps of Old Masters" the Heine Boiler Company, St. Louis, Mo., in a new bulletin gives the history of a boiler which has been in the service of the Berkey & Gay Furniture Company at Grand Rapids, Mich., for forty years and is still in daily operation at its original pressure. Several illustrations taken in the plant of the Heine Boiler Company with a list of boiler types made by the company are also contained.

Nordberg Diesel Engines.—The Nordberg Manufacturing Company, Milwaukee, Wis., is distributing a reprint in catalogue form from the "Diesel and Oil Engineering Handbook" describing in great detail the Nordberg-Carels type of Diesel engine. This company has been engaged in the manufacture of Diesel engines for over ten years, having obtained the American rights for the two-cycle type built by the Carels Bros. of Ghent, Belgium, who have designed and built Diesel engines for twenty-five years. This company is now equipped to build engines ranging from 330 to 6,000 brake horsepower in units of from 3 to 6 cylinders. Complete details and construction drawings with illustrations of various size engines and installations are contained in the catalogue.

Mayari Pig Iron.—What constitutes a handbook of Bethlehem Mayari Pig Iron, a natural nickel chromium alloy iron for making high grade castings, is listed as publication No. 26 and is now for sale by the Bethlehem Steel Company, Bethlehem, Pa. Two articles by Dr. Richard Moldenke, international authority on foundry work, have been included in this book. The physical and chemical properties, structure, test and application of this type pig iron are given.

Blacker Hammers.—A new catalogue, describing the Blacker "B" blacksmith hammer, with suitable illustrations of various types operating on the same principle, has been prepared by the Blacker Engineering Company, Grand Central Terminal, N. Y. The special feature of this hammer is that it travels over the anvil face, thus making hand forging operations and utility smithing possible without helpers. Illustrations of forging work done with this hammer are contained in the catalogue.

Better Foundry Practice.—A booklet taking up the construction, location and layout of a building to be devoted to foundry work has been prepared by the Policyholders' Service Bureau, Group Insurance Division of the Metropolitan Life Insurance Company, New York. This bulletin is the first of a series of ten and deals particularly with the layout of foundry departments, storage of materials, productive departments, multi-story foundries, types of roof and flooring, methods of heating, lighting and ventilation systems.

Condenser Tubes.—A reprint of a paper on condenser tubes, presented at the November 8, 1923, meeting of the Metropolitan Section of the American Society of Mechanical Engineers by William R. Webster, vice president of the Bridgeport Brass Company, Bridgeport, Conn., has been made up in catalogue form and is now being distributed by the company. Few problems relating to the operation of steam power plants, both marine and stationary, involve greater perplexities than those surrounding the endurance of the tubes employed in surface condensers where salt or contaminated cooling water is used. The paper deals with the failures to which condenser tubing is exposed and the methods taken to prevent these failures by the use of correct composition alloys. Numerous microphotographs are shown to bring out the points emphasized by the author.

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SEPTEMBER, 1924

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Prest-O-Lite Dissolved Acetylene is made in 28 plants, stocked in 44 warehouses, and sold through 19 District Sales Offices.

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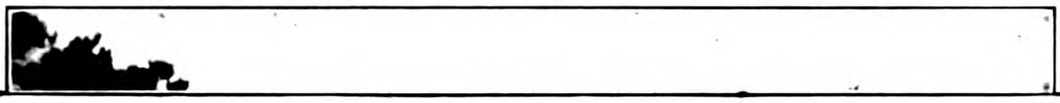

YOKOHAMA. No matter what ports your ships may touch, you can contract in advance for deliveries of Gargoyle Marine Oils.

Tried— and not found wanting

IN the "earthquake belt" or on the high seas the ships of the world go steadily about their business. The nearer a ship can come to clock-like certainty of operation the more business it will attract and the more dividends it will make for the line's stockholders.

Certainty of operation of marine engines through correct lubrication has for many years been the specialized study of the Vacuum Oil Company. The outcome of these studies is a brand of lubricants, Gargoyle Marine Oils, known and marketed throughout the world.

The scientific accuracy with which these dependable oils meet the requirements of every type of marine engine is well known in shipping circles. In every country, engineers comment upon it. Their combined testimony is that while Gargoyle Marine Oils may cost a trifle more at the outset, their certain ability to reduce friction, minimize repairs and prevent engine trouble at sea, makes them the most economical lubricants obtainable.

These high-grade oils may be had in more than 300 ports. See column at right for convenient method of arranging for deliveries.

GARGOYLE

Marine Oils

A grade for each type of service

What the Gargoyle Marine Oil Agreement

means to Ship Owners all over the World

Through its "memorandum of agreement," the Vacuum Oil Company offers you an economical and effective plan for the correct lubrication of your fleet as a unit.

First Step:

Our representatives confer with you on the lubrication needs of your individual ships. The oils which we recommend will be scientifically correct for each engine and machine.

Second Step:

We prepare an agreement with you, under which we will contract to deliver the required oil when and where wanted—at any port, at any date.

By this fleet-plan of lubrication, doubt and uncertainty as to quality of lubrication are done away with. Uncertain deliveries are guarded against. All the financing of your entire supply of oil is taken care of through your head office.

Our representative will be glad to give you further details.

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OCTOBER, 1924

Marine Engineering
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USERS of acetylene for welding and cutting secure the economy that comes from stocking one kind of fuel gas and owning one type of apparatus.

Users of Prest-O-Lite Dissolved Acetylene have the further assurance of the most reliable and dependable source for acetylene.

Prest-O-Lite Dissolved Acetylene is made in 28 industrial centers, warehoused in 44 other centers, and sold through District Sales Offices in 19 cities.

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Vol. XXIX **No. 10**

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BOMBAY No matter what ports your ships may touch, you can contract in advance for deliveries of Gargoyle Marine Oils.

Marine engine economy —*by the barrelful*

IN Bombay this morning, a certain warehouse is preparing to fill an incoming ship's requirements of economical Gargoyle Marine Oils. Another warehouse in Stockholm is making similar preparations. In Cape Town, Kobe, Aberdeen, Wellington, Rio, Melbourne—in every corner of the world, — engine economy by the barrelful is waiting the arrival of incoming ships.

With the use of these high-grade oils, preventable friction is being scientifically reduced in countless engine rooms, fewer repairs are needed, less power is being used and more dependable operation is being insured. Economy in results is giving Gargoyle Marine Oils a wider use than any other one brand of oil in the world.

Are your ships getting the benefit of this economy?

You want to cut down operating expenses — cut them to the bone. Gargoyle Marine Oils offer you a proven method of doing it.

What is standing in the way?

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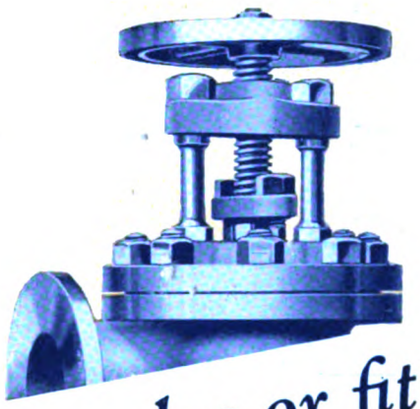

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The Prest-O-Lite Company has made possible the universal use of acetylene in this easily portable and economical form.

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DARDANELLES. No matter what ports your ships may touch, you can contract in advance for deliveries of Gargoyle Marine Oils.

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"Weigh Anchor—Weigh Trouble"

SOON this ship will clear the Dardanelles; her engines will settle down for her long run. Will she be delayed at sea on account of engine trouble? Will she waste fuel to overcome friction in her engines? Will she be caught with the need for repairs due to overheated bearings. Or, will her running equipment be protected by the best and cheapest insurance possible—scientifically correct lubrication?

These are questions for every ship owner, captain and engineer to answer.

The Vacuum Oil Company offers you from its own refineries the highest quality of lubricating oil for every type of marine engine afloat. This company specifies with scientific accuracy the correct grades of Gargoyle Marine Oils to use. So economical have they proven for the world's shipping that their distribution now circles the globe.

In reducing friction, in preventing wear which necessitates expensive repairs, and in adding to the life of marine machinery, these high-grade oils are preeminent. Why not use them?

We shall be glad to have an experienced representative look into your lubrication problem and advise you what economies you can expect.

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A grade for each type of service

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Comprising Pump and motor unit suitable for Operating Ships'

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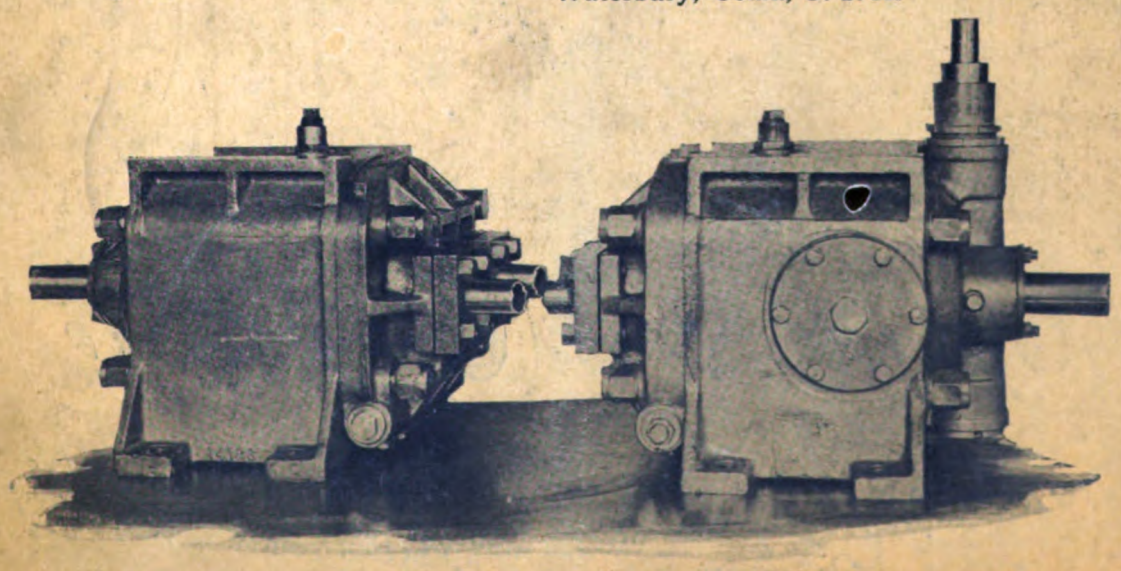

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Prest-O-Lite cylinders are made in its own factory according to its own design. Prest-O-Lite plants in 28 cities charge these cylinders with dissolved acetylene made from raw materials tested by expert chemists. Prest-O-Lite warehouses in 44 cities make Prest-O-Lite service convenient to every user in the United States. District Sales Offices in 19 cities arrange for a dependable supply of pure acetylene for you.

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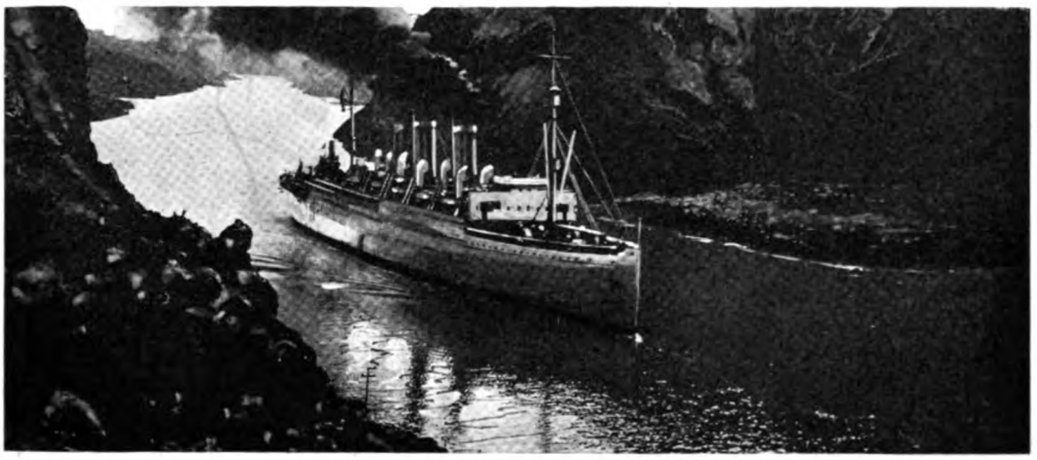
Panama Canal No matter what ports your ships may touch, you can contract in advance for deliveries of Gargoyle Marine Oils.



How to wipe out initial costs

"THE high cost of digging the Panama Canal will be a waste of money." So said the penny-wise patriots of twenty years ago.

There are still ship owners and engineers who fail to see the far-reaching economy of using high-grade marine oils — because their initial cost per gallon may run a trifle higher than inferior oils.

Results are what count. The results of Gargoyle Marine Oils have justified their universal use. These results are—

—reduction of friction,
—less wear,
—fewer over-haulings of engines in port.

Add these results together and you will find Gargoyle Marine Oils the most economical lubricants you can purchase. So economical are they that the world's shipping uses more of them than any other single brand.

Gargoyle Marine Oils scientifically correct for every type of marine engine may be had in any port of the world.

See column at right.

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New York will never go dry

THE water supply system for Greater New York was designed with the thoughts of reserve supply and safety foremost. Up in the Catskills, near the source of this water supply, is the Ashokan reservoir. This is ample for New York in the far distant future. A few miles away is the Kensico reservoir, built for safety. On the outskirts of the city there is a third reservoir, and on Staten Island a fourth.

Linde's national system of 115 plants and warehouses is like the New York water system. The reserve facilities of any or all of these plants and warehouses can be directed toward the single plant or warehouse that is your source for oxygen.

THE LINDE AIR PRODUCTS COMPANY
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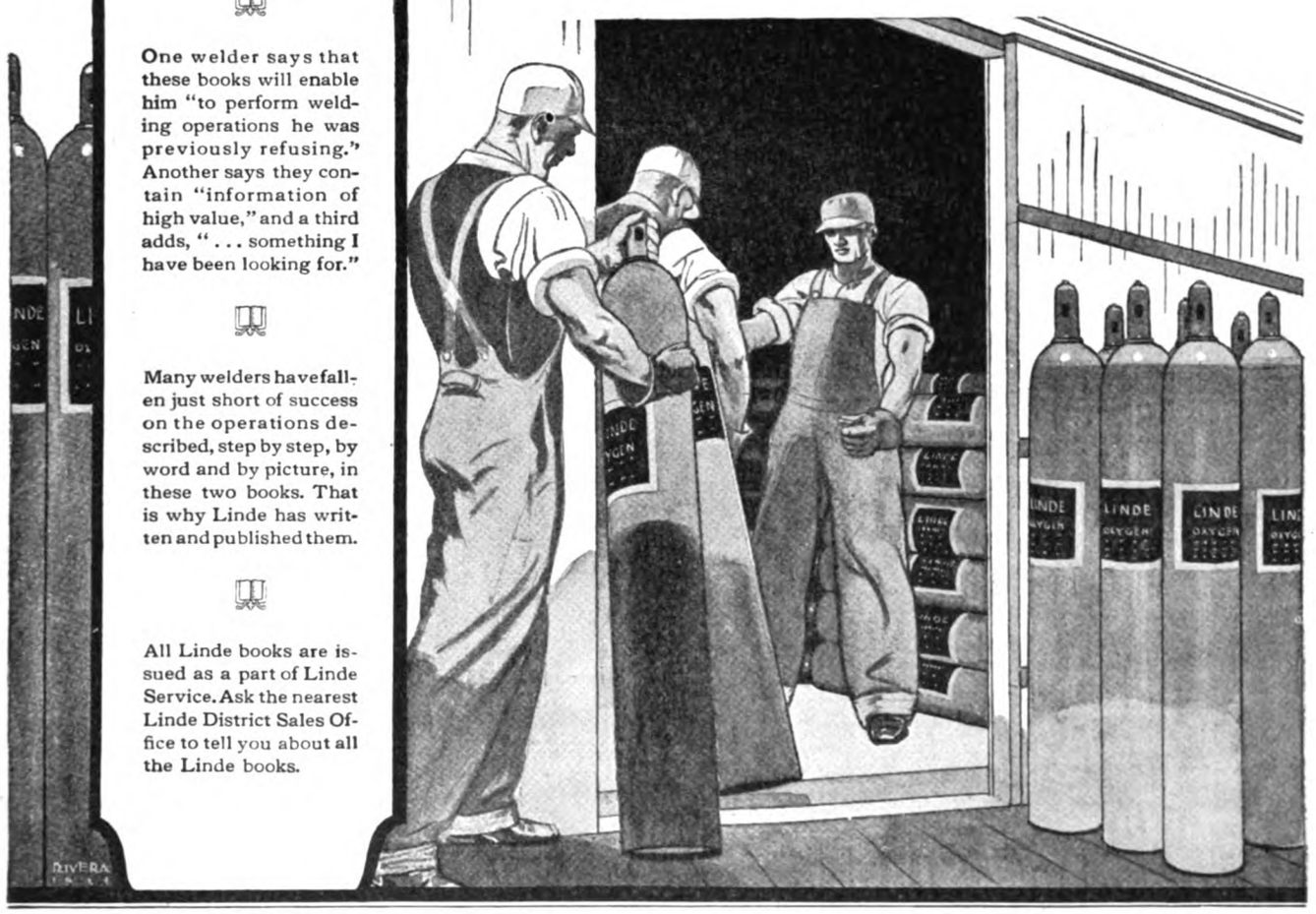
The Linde Company has recently issued two new books: *"Step by Step in Gas Welding a Crank Case"* and *"Step by Step in Gas Welding a Cylinder Block."* Like all Linde books, they are written from practical experience and to fill a definite need.

One welder says that these books will enable him "to perform welding operations he was previously refusing." Another says they contain "information of high value," and a third adds, "... something I have been looking for."

Many welders have fallen just short of success on the operations described, step by step, by word and by picture, in these two books. That is why Linde has written and published them.

All Linde books are issued as a part of Linde Service. Ask the nearest Linde District Sales Office to tell you about all the Linde books.



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Twenty-two Floating Docks

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Oil Burning Equipment—Electric Drive Installations

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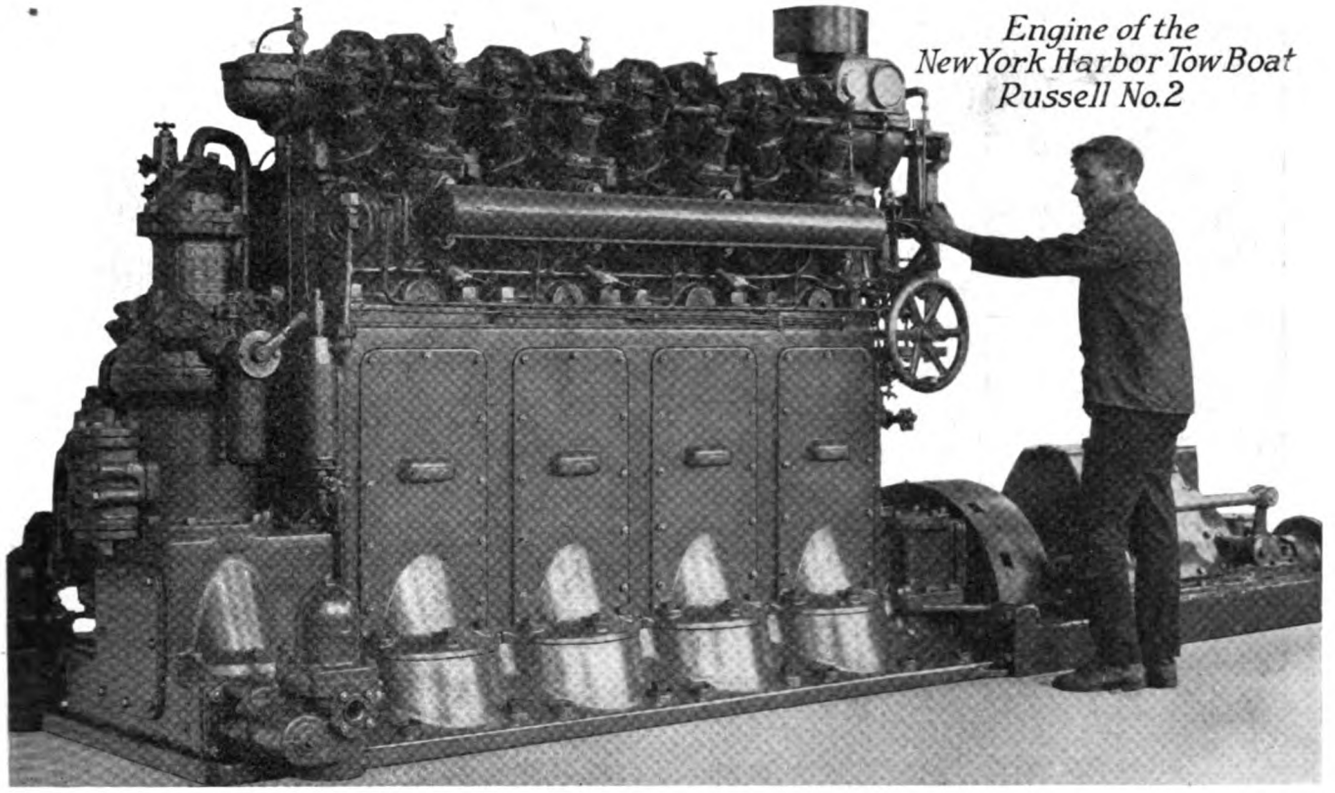
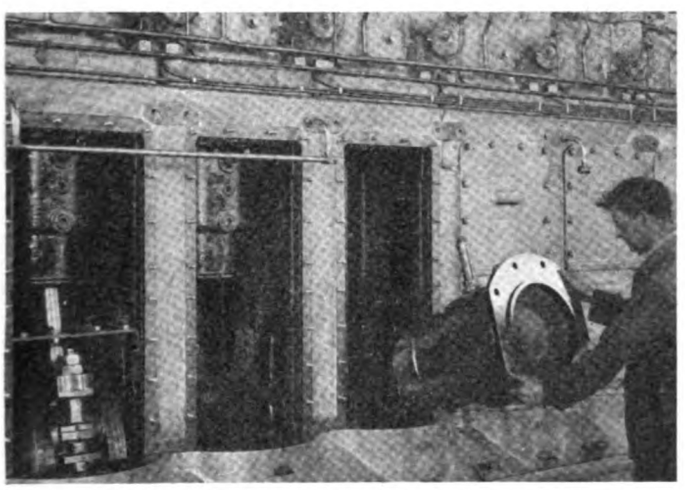


Engine of the New York Harbor Tow Boat Russell No. 2

BUILT *Right*-COST *Less*



Lombard Engines are *built right* for efficiency, reliability, and endurance. Design, materials and workmanship are based upon comprehensive experience and justified by the service record of these engines.

Free and complete access to all parts; simple adjustments; design providing for inexpensive renewals; pressure-steam lubrication; liberally proportioned parts; conservative brake M. E. P. ratings; and the ideal type of combustion with the most practical system of fuel handling and control — these are substantial reasons why it will *cost less* to own a Lombard Diesel.

Send for descriptive Bulletin 21-S.

THE LOMBARD GOVERNOR CO.
700 MAIN STREET
ASHLAND, MASSACHUSETTS

LOMBARD

"Study the Structure"

DIESEL OIL ENGINES

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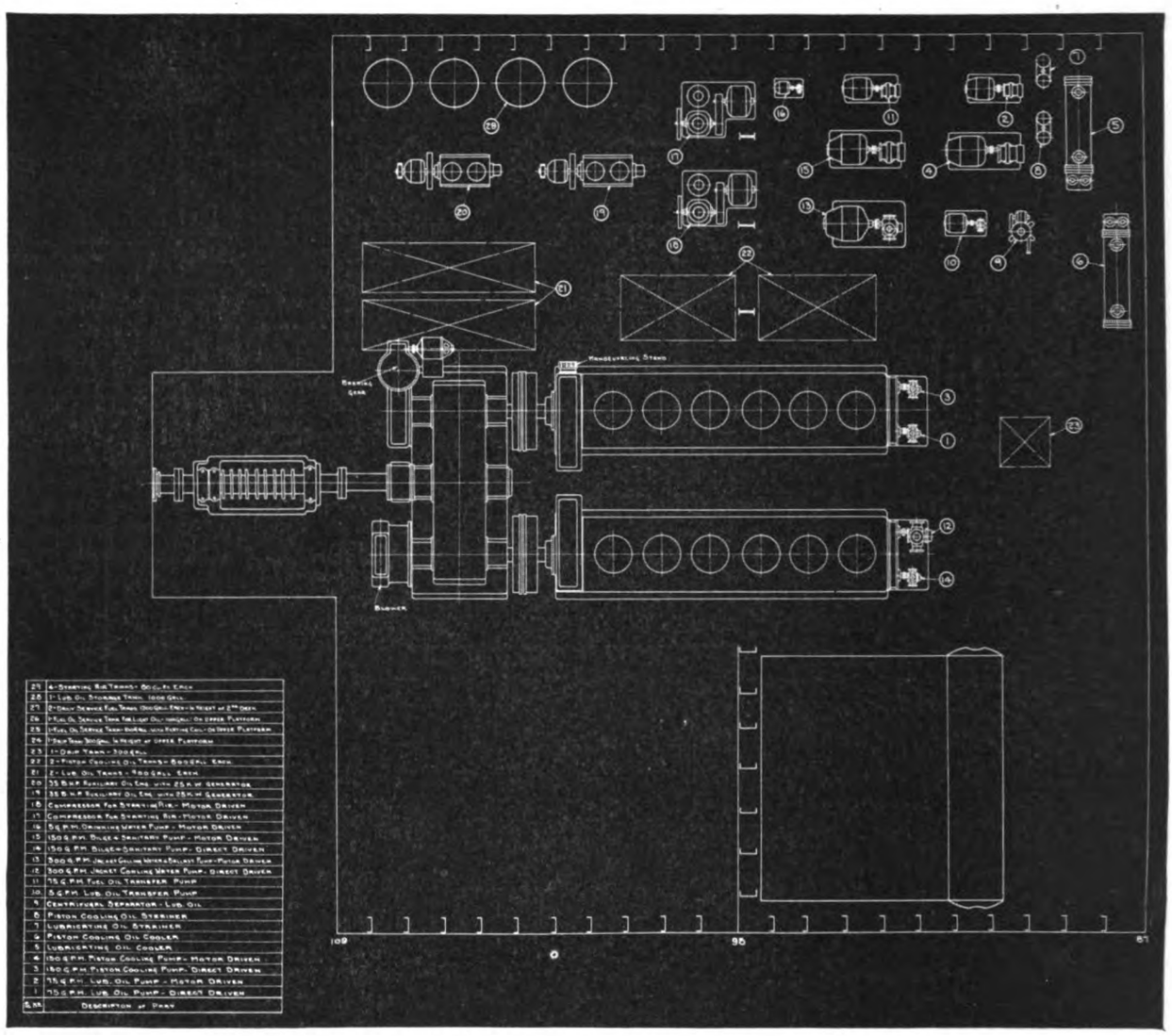

GEARED MARINE OIL ENGINES

Any Propeller Speed
Small Space
Light Weight
Low Cost

THE FALK CORPORATION

Milwaukee **Wisconsin**

FALK

FALK HERRINGBONE GEARS FALK-BIBBY FLEXIBLE COUPLINGS FALK MARINE STEEL CASTINGS

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AM FORGE

Upset Forgings

Flanged Shafts—For Instance

THE Upset forging process produces better flanged shafts at a marked saving in metal, in machining, in die costs, and—usually—in first cost.

The two forgings shown on this page were produced from the same blueprint. The hammered forging weighs 316 pounds, the Upset forging 250, a saving of 66 pounds in metal-cost and 66 pounds in freight. And there is, of course, 66 pounds less stock to machine away.

Large Range of Sizes

Our capacity on forgings of this type runs up to 15-inch diameter head, with shaft 5¼-inch diameter—any length.

An order for 10,000 large shafts is handled as a mere matter of routine. Yet we do not despise small orders. And the large number of dies now on hand makes it likely that any size you require can be produced at once without delay or die-cost.

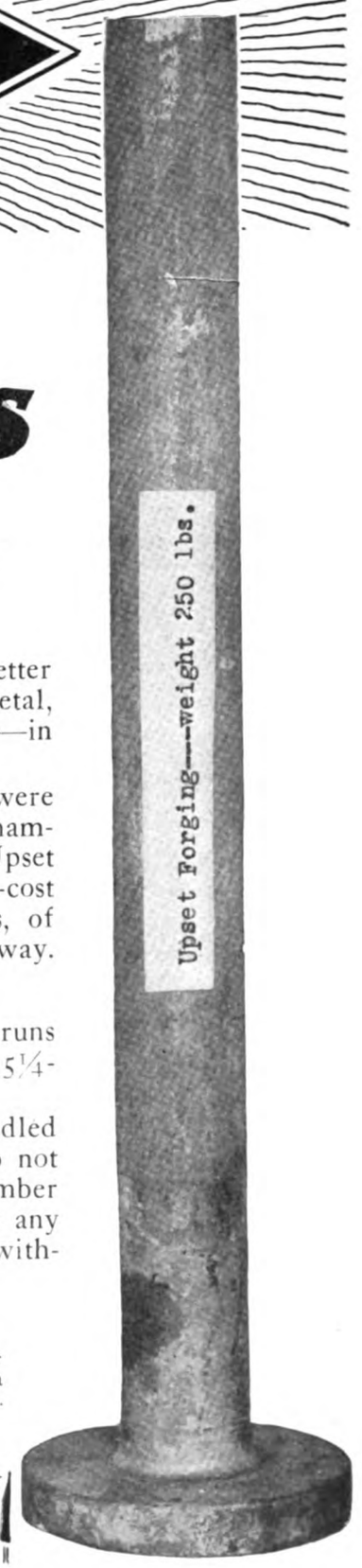
Send blue prints for estimates.

Whatever your forgings, let us determine whether they can be *upset-forged*. If they can, you'll save a lot of money and secure a better finished product.

Ask for our new book on Upset Forgings

American Forge Company

2633 South Hoyne Avenue
Chicago, Illinois



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Only repeated endorsement will

HASKELITE on S.S. Ancon

THE reconditioned S.S. "Ancon" of the Panama Railroad will have Haskelite bulkheads throughout. Approximately 30,000 square feet will be installed by the W. & A. Fletcher Co.

Haskelite was specified because the owners and the architect wanted a combination of beauty, strength, light weight, durability, sanitation and economy in the stateroom accommodations. Only Haskelite can meet such a specification.

In addition to Haskelite bulkheads, the S.S. "Ancon" will be fitted with Plymetl exterior doors. The Plymetl door, which is a combination of Haskelite and steel, promises to rapidly supplant the solid wood door because it cannot check, split or warp and in addition is fire resistant. These doors are manufactured to size eliminating all work in the yard except the fitting of hardware and hanging.

Every architect and builder knows Haskelite to be the finest bulkhead panel obtainable. For more than five years it has been specified in connection with the foremost new construction and reconditioning contracts.

Indisputable evidence of this superiority is the fact that Haskelite is the only commercially obtainable plywood to be given the Grade A rating of the U. S. Navy for waterproof plywood.

HASKELITE MFG. CORPORATION
133 W. Washington St., Chicago, Ill.

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...upport a claim upon leadership

and 23 Other Vessels

UPON the completion of contracts now under way there will be 24 passenger ships in which Haskelite has been installed, and 4 car ferries, in addition to a number of yachts and small river steamers. The list:

Vessel	Operator	Architect
SS. Leviathan	U. S. Lines	Gibbs Bros.
SS. Republic	U. S. Lines	Gibbs Bros.
SS. George Washington	U. S. Lines	U. S. Lines
SS. America	U. S. Lines	U. S. Lines
SS. Pres. Harding	U. S. Lines	U. S. Lines
SS. Pres. Roosevelt	U. S. Lines	U. S. Lines
SS. Pres. Polk	Dollar Line	U. S. Lines
SS. Pres. Adams	Dollar Line	U. S. Lines
SS. Boston*	Eastern SS. Line	Theo. E. Ferris
SS. New York*	Eastern SS. Line	Theo. E. Ferris
SS. Seminole	Clyde Line	Theo. E. Ferris
SS. Cherokee	Clyde Line	Theo. E. Ferris
SS. Carabobo	Red D Line	Theo. E. Ferris
SS. DeWitt Clinton	Hudson River Day Line	J. W. Millard
SS. Alexander Hamilton	Hudson River Day Line	J. W. Millard
SS. Greater Detroit	D & C Line	Frank Kirby
SS. Greater Buffalo	D & C Line	Frank Kirby
SS. Esther Weems	Baltimore & Carolina SS. Co.	A. M. Main
SS. Mary Weems*	Baltimore & Carolina SS. Co.	A. M. Main
SS. Dist. of Columbia	Norfolk & Washington Steamboat Co.	A. M. Main
SS. State of Delaware**	Wilson Line	George G. Sharp
SS. State of Pennsylvania**	Wilson Line	George G. Sharp
SS. Ancon*	Panama Railroad	Carroll S. Smith
SS. United States	Peninsula & Northern Navigation Co.	Henry Gielow

(*Indicates Plymetl also used. **Plymetl exclusively)

The Manitowoc Shipbuilding Corp. has installed Haskelite in car ferries Nos. 21 and 22 of the Pere Marquette Railroad and two Ann Arbor ferries.

HASKELITE MFG. CORPORATION
133 W. Washington St., Chicago, Ill.

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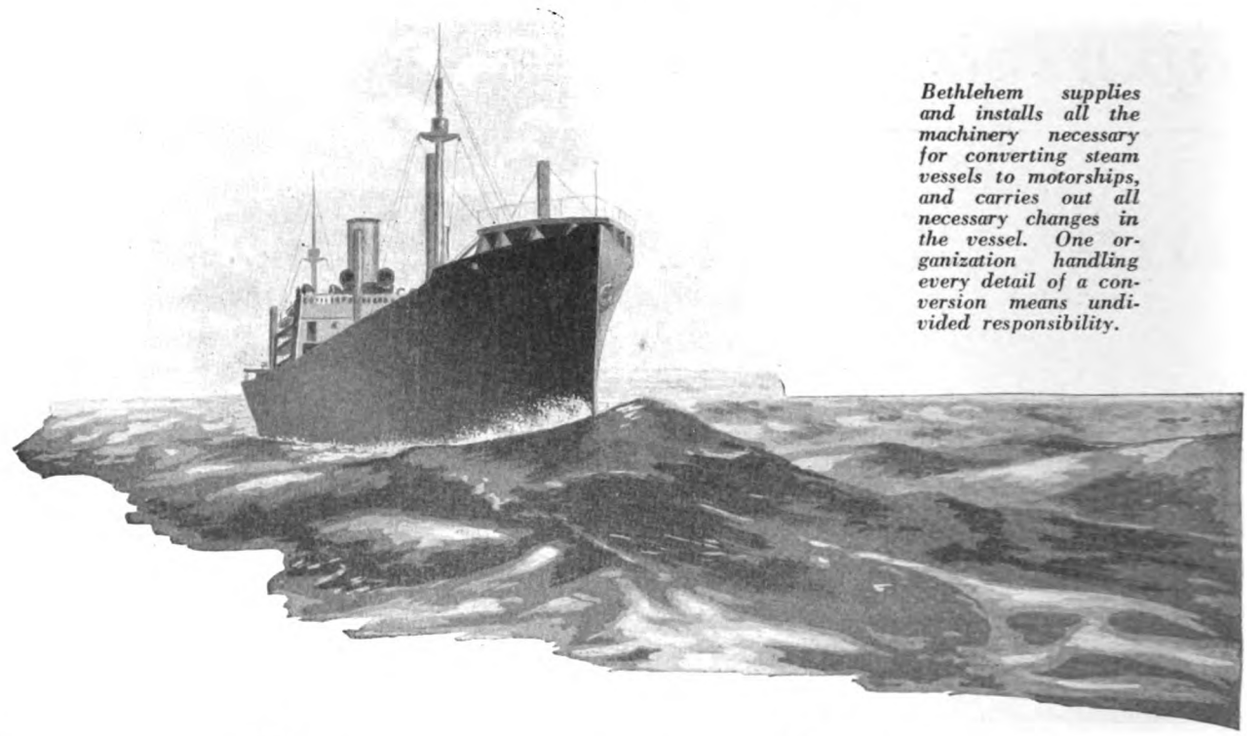
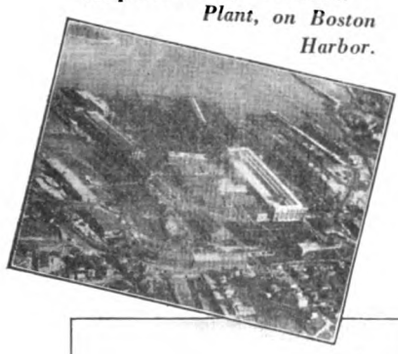


Bethlehem supplies and installs all the machinery necessary for converting steam vessels to motorships, and carries out all necessary changes in the vessel. One organization handling every detail of a conversion means undivided responsibility.

Complete, to the smallest detail—

Airplane View, Fore River Plant, on Boston Harbor.



Airplane View, Potrero Works, Union Plant, on San Francisco Harbor.

BETHLEHEM takes over steam vessels in which oil engine drive is to be installed and carries out the entire work of conversion, complete to the smallest detail.

This includes furnishing all the equipment.

As a result, when Bethlehem completes a conversion and the motorship is turned over to the owner, he is secure in these two vital points:

—All the mechanical units in his motorship are of Bethlehem manufacture; all embody the same standards and are designed to work together as a complete unit.

—The entire responsibility for the satisfactory installation and operation of the motorship is centered in one thoroughly competent organization.

BETHLEHEM SHIPBUILDING CORPORATION, Ltd.,
BETHLEHEM, PA.

GENERAL SALES OFFICES: 25 BROADWAY, NEW YORK CITY

Sales Offices: Boston, 141 Milk St.; Philadelphia, Widener Bldg.; Wilmington, Foot of West St.; Baltimore, Gay and Lombard Sts.; San Francisco, Matson Bldg.

BETHLEHEM

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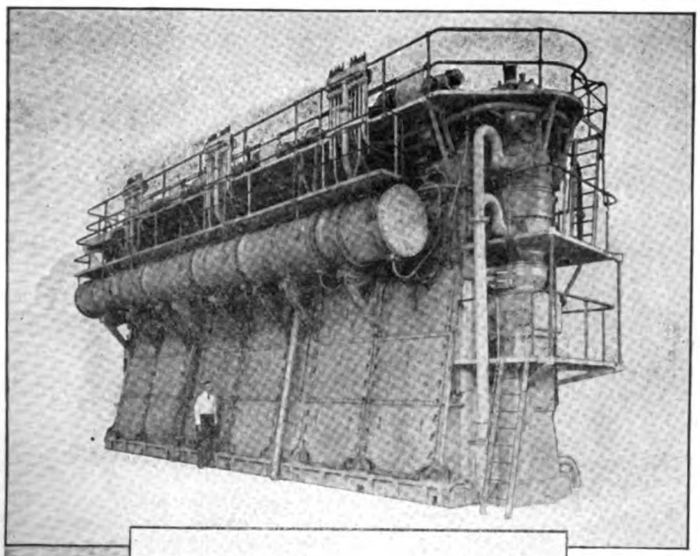
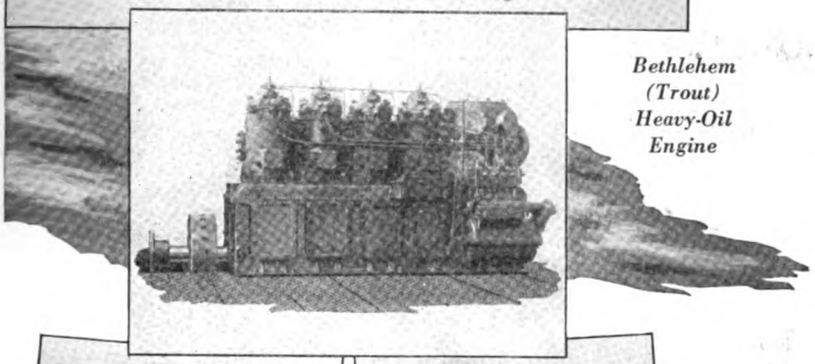
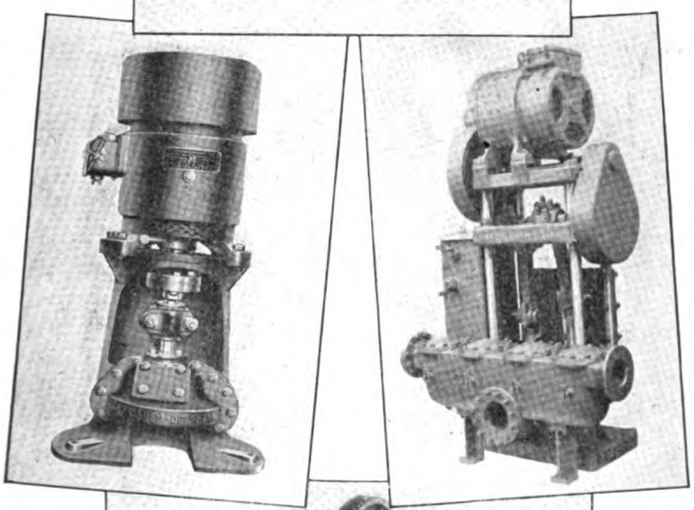


6-cylinder Bethlehem Oil Engine



Bethlehem (Trout) Heavy-Oil Engine



Bethlehem Electric-driven Windlass

Bethlehem-Drysdale Upright Pump

Bethlehem-Weir Power Pump

A Bethlehem Unit *for every* Motorship Requirement

Main Engine

The Bethlehem Oil Engine (Large Unit Type) is of the two-cycle type, is built in units of four, six and eight cylinders, and in sizes from 1500 to 4200 B.H.P. Service at sea has amply demonstrated its dependability and high fuel economy. It is very compact and can usually be installed with few alterations in the vessel.

Main Generator Drive

The Bethlehem-Trout Heavy-Oil Engine is specially adapted for driving generators or other machinery in motorship installations. It is a two-cycle Diesel-type Engine, with port scavenging and airless fuel injection. Built in units of from 50 to 480 B.H.P.

Engine Room Auxiliaries

Bethlehem-Weir and Bethlehem-Drysdale Electric-driven auxiliaries for motorships embody the correct design and rugged construction essential to marine machinery. They can be depended upon for continuous satisfactory service. These include pumps for circulating water, lubricating oil and fuel oil; ballast, bilge and ballast, general service, and sanitary pumps; air compressors.

Deck Machinery

Bethlehem Electric-driven Deck Machinery for Motorships covers a complete range of types and sizes, and includes windlasses, cargo winches, mooring winches, warping winches, steering gears and capstans.

BETHLEHEM

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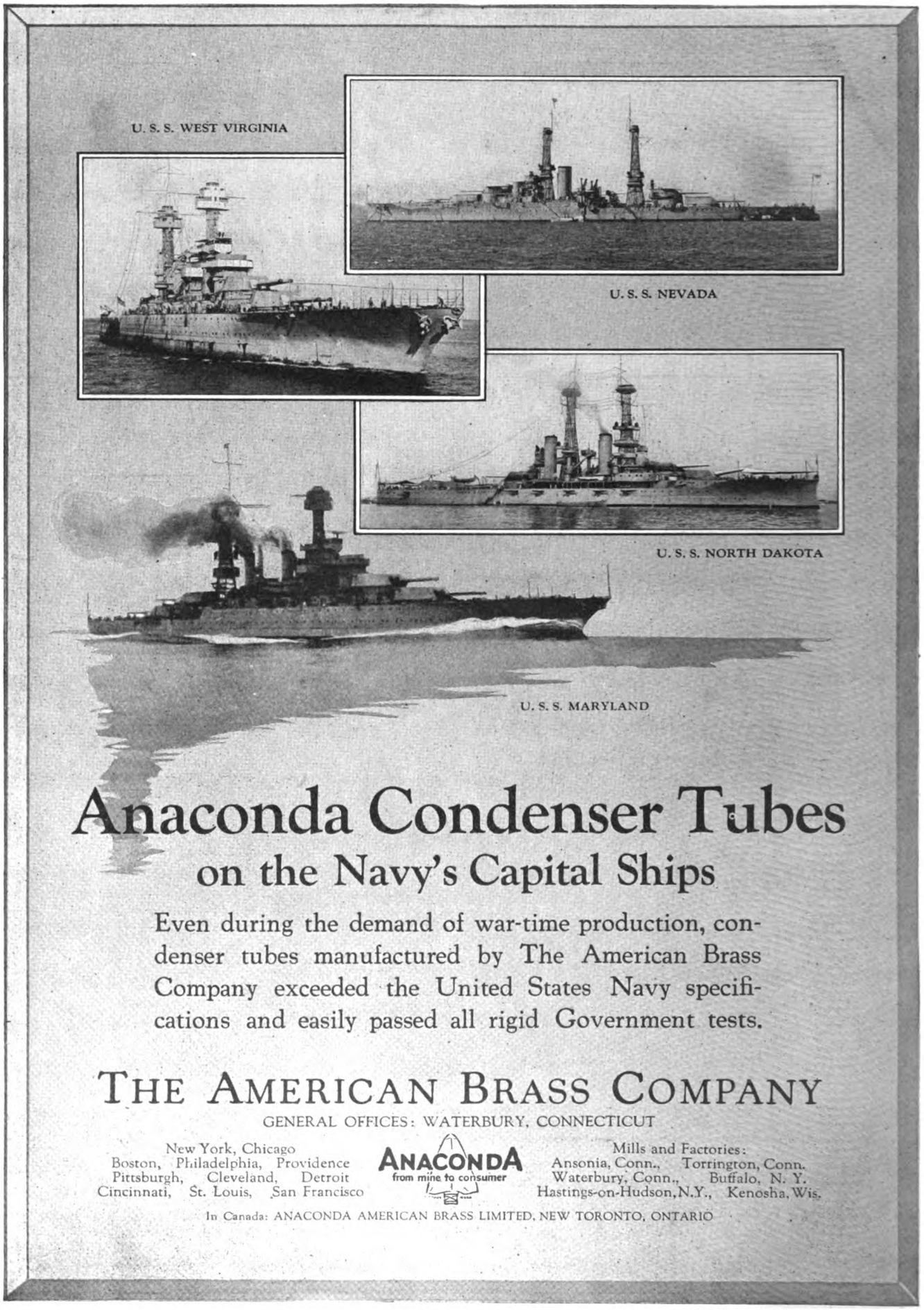

Anaconda Condenser Tubes
on the Navy's Capital Ships

Even during the demand of war-time production, condenser tubes manufactured by The American Brass Company exceeded the United States Navy specifications and easily passed all rigid Government tests.

THE AMERICAN BRASS COMPANY

GENERAL OFFICES: WATERBURY, CONNECTICUT

New York, Chicago
Boston, Philadelphia, Providence
Pittsburgh, Cleveland, Detroit
Cincinnati, St. Louis, San Francisco

ANACONDA
from mine to consumer

Mills and Factories:
Ansonia, Conn., Torrington, Conn.
Waterbury, Conn., Buffalo, N. Y.
Hastings-on-Hudson, N.Y., Kenosha, Wis.

In Canada: ANACONDA AMERICAN BRASS LIMITED, NEW TORONTO, ONTARIO

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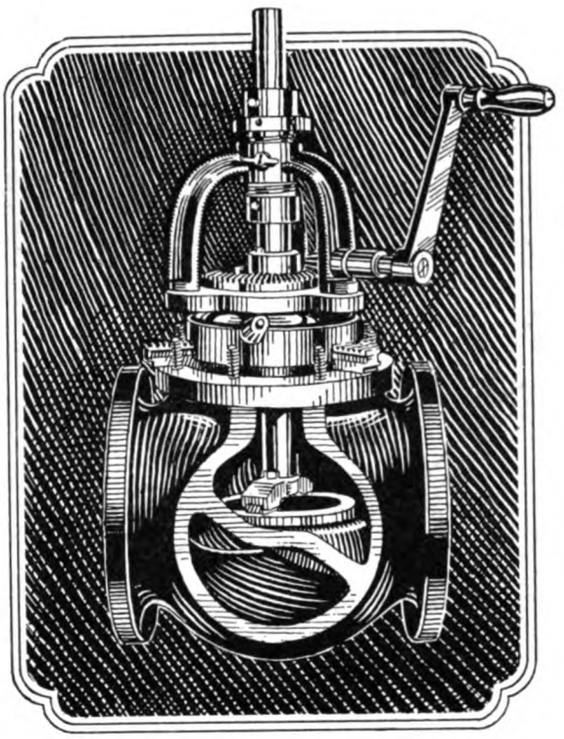

This Inexpensive Outfit Saves Over 90% Of Your Valve Maintenance Expense

The high cost of valves, steam and labor has made the Dexter Globe Valve Reseating Machine an economic necessity. No efficiently operated plant can afford to ignore the savings in valves, steam and repair expense resulting from its use.

The Dexter Machine is exceedingly simple and rapid in operation. It is not necessary to remove the valve body from its pipe line, so that much labor and all strain on piping is avoided. The Machine is quickly adjusted to the valve casing and a few turns of the handle makes the worn valve seat perfectly true and smooth. A Disc Cutter is provided to reface the valve disc so that it makes a steam-tight fit with the seat.

A Dexter Outfit practically takes the place of an expensive valve repair department. Its cost is insignificant compared with the savings it makes.

Write for Catalog 23.

THE LEAVITT MACHINE COMPANY
13 East River Street Orange, Massachusetts, U. S. A.

Canadian Agency: Darling Bros., Ltd., 129 Prince Street, Montreal
British Agency: Cromil Engineering Co., E. Floor, Milburn House, Newcastle-on-Tyne

7495

DEXTER VALVE RESEATING MACHINES

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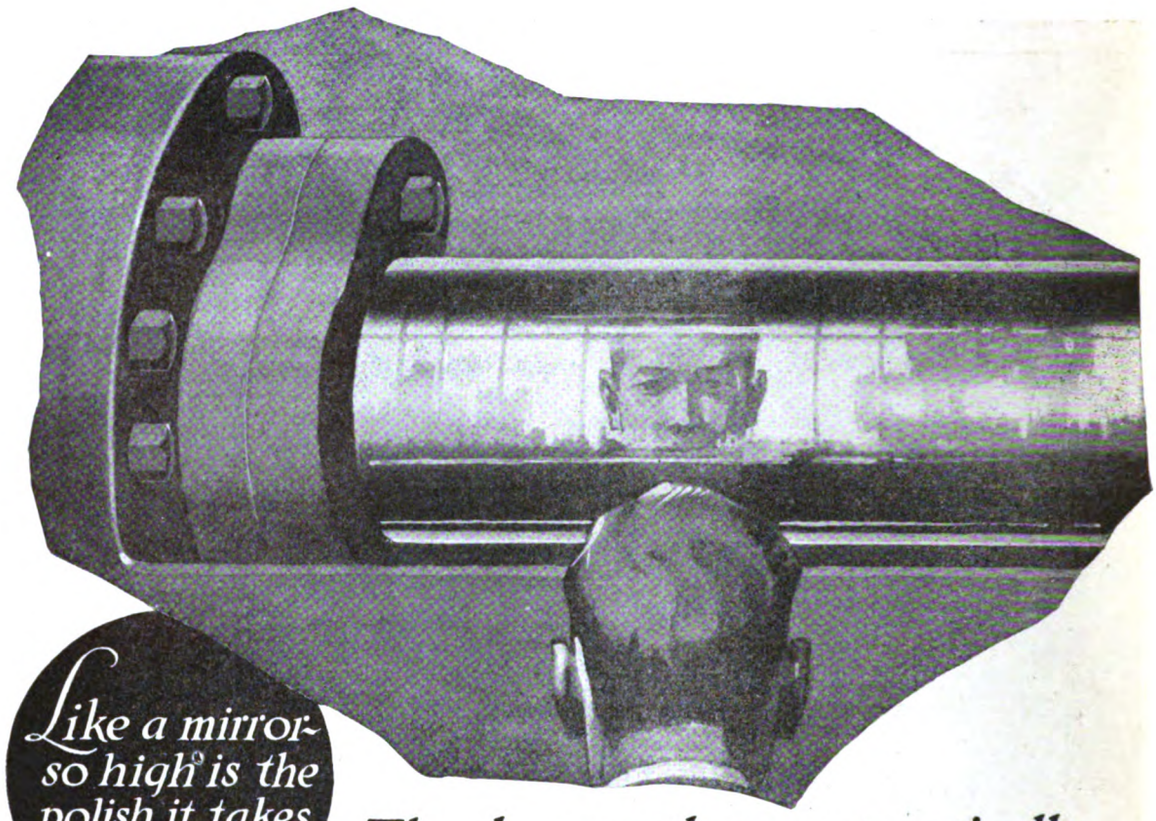

Like a mirror— so high is the polish it takes

Thus because they are practically frictionless, Monel Metal pump rods *wear longer and eliminate repacking troubles.*

Standard for the U. S. Navy—standard for many big oil refineries—standard for firms everywhere, who have tested the economy of Monel Metal pump rods.

The properties of Monel Metal effect economies in three major ways:

1. **Their mirror-like surface and glass-like polish**
   - **—reduce packing and rod friction,**
   - **—prevent hardening of the packing and minimize maintenance costs,**
2. **Their immunity to rust and freedom from corrosion**
   - **—prevent pitting when idle**
   - **—eliminate rust-scale deposited in packing, causing scoring of rod,**
3. **The great strength and inherent toughness of Monel Metal**
   - **—permit the use of smaller rod than the use of bronze allows**
   - **—offer greater resistance to the erosion caused by superheated steam.**

The superiority of Monel Metal is a proven fact. We want you to find out for yourself how economical Monel Metal really is.

SEND FOR "LIST B" OF AVAILABLE LITERATURE

THE INTERNATIONAL NICKEL COMPANY
67 WALL STREET, NEW YORK CITY

Write distributor nearest you for special money-back trial offer

Whitehead Metal Products Company,
67 Washington Street North, Boston, Mass.
Whitehead Metal Products Company
of New York, Inc.,
261 Canal Street, New York.
Branch House: 725 Arch St., Philadelphia, Pa.
Branch House: 215 Frelinghuysen Avenue,
Newark, N. J.
Williams & Company, Inc.,
901 Pennsylvania Avenue, Pittsburgh, Pa.
J. M. Tull Rubber & Supply Company,
150 Marietta Street, Atlanta, Ga.
Steel Sales Corporation,
129 South Jefferson Street, Chicago, Ill.
Branch House: 843 Book Bldg., Detroit, Mich.
Edward Schwartz Mill Supply Co., Inc.,
520 Toulouse Street, New Orleans, La.
Eagle Brass Foundry Company,
21 Spokane Street, Seattle, Wash.
Pacific Foundry Company,
Harrison and 18th Streets, San Francisco,
Cal.
Robert W. Bartram,
129 Duke Street, Montreal, Province Quebec.
Peckover's, Ltd.,
Foot of West Market St., Toronto, Ont.

INCo Monel metal

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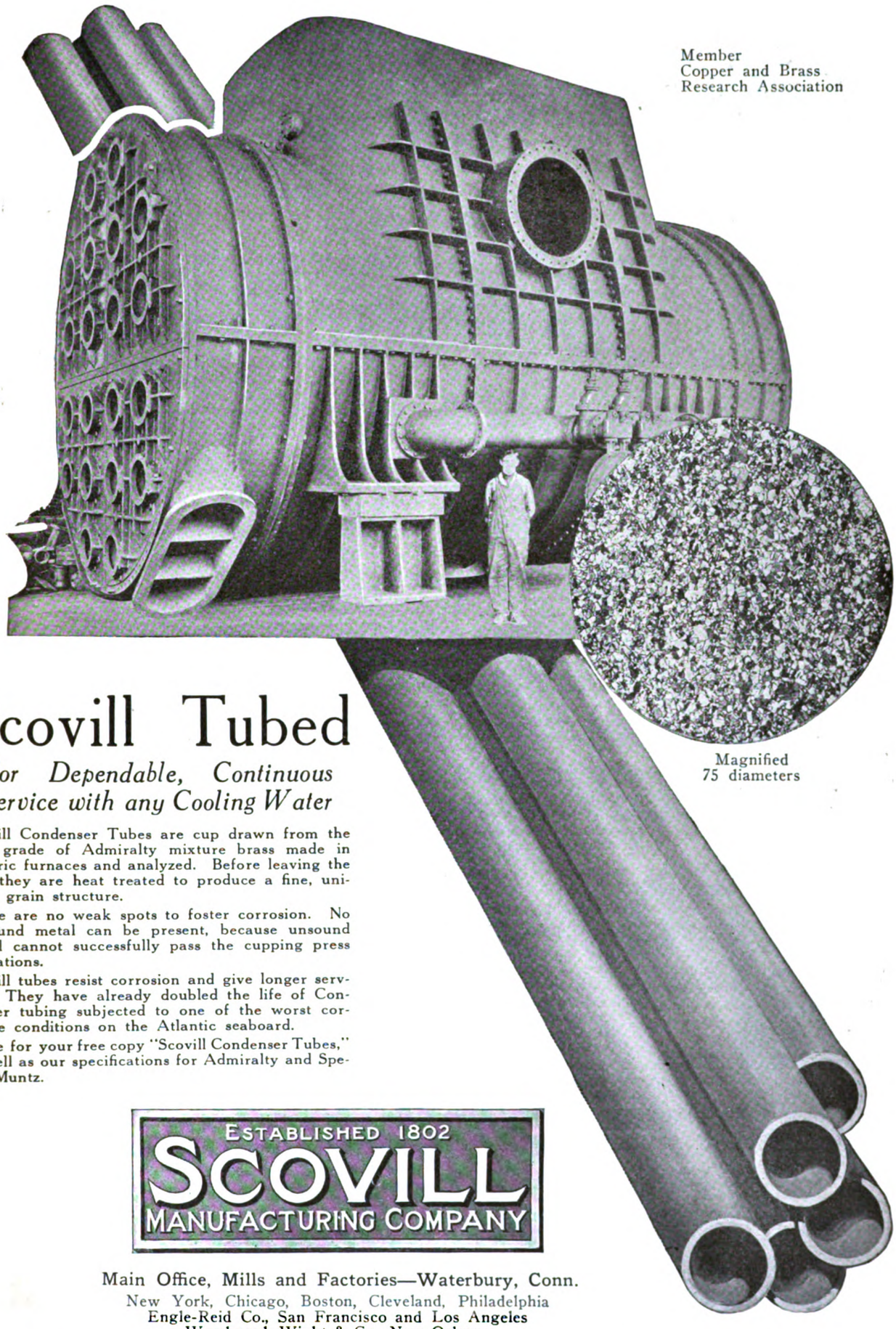

Member
Copper and Brass
Research Association

Scovill Tubed

For Dependable, Continuous Service with any Cooling Water

Scovill Condenser Tubes are cup drawn from the best grade of Admiralty mixture brass made in electric furnaces and analyzed. Before leaving the mill they are heat treated to produce a fine, uniform grain structure.

There are no weak spots to foster corrosion. No unsound metal can be present, because unsound metal cannot successfully pass the cupping press operations.

Scovill tubes resist corrosion and give longer service. They have already doubled the life of Condenser tubing subjected to one of the worst corrosive conditions on the Atlantic seaboard.

Write for your free copy "Scovill Condenser Tubes," as well as our specifications for Admiralty and Special Muntz.

Magnified
75 diameters

ESTABLISHED 1802
SCOVILL
MANUFACTURING COMPANY

Main Office, Mills and Factories—Waterbury, Conn.
New York, Chicago, Boston, Cleveland, Philadelphia
Engle-Reid Co., San Francisco and Los Angeles
Woodward, Wight & Co., New Orleans

BRASS MILL PRODUCTS—MANUFACTURED GOODS TO ORDER

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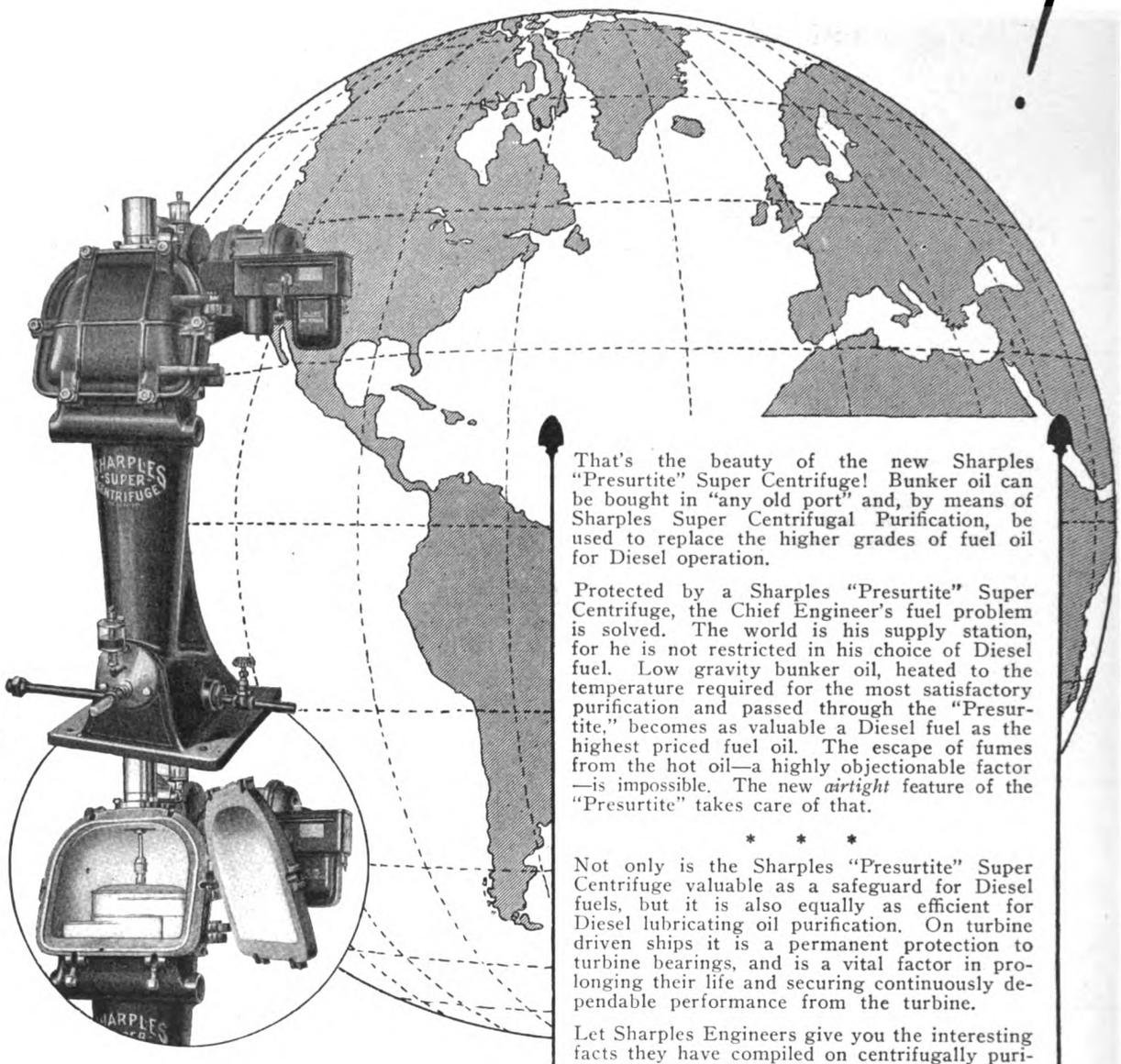
A Great Force

"Any Old Port" for Diesel Fuel!



That's the beauty of the new Sharples "Presurtite" Super Centrifuge! Bunker oil can be bought in "any old port" and, by means of Sharples Super Centrifugal Purification, be used to replace the higher grades of fuel oil for Diesel operation.

Protected by a Sharples "Presurtite" Super Centrifuge, the Chief Engineer's fuel problem is solved. The world is his supply station, for he is not restricted in his choice of Diesel fuel. Low gravity bunker oil, heated to the temperature required for the most satisfactory purification and passed through the "Presurtite," becomes as valuable a Diesel fuel as the highest priced fuel oil. The escape of fumes from the hot oil—a highly objectionable factor—is impossible. The new *airtight* feature of the "Presurtite" takes care of that.

* * *

Not only is the Sharples "Presurtite" Super Centrifuge valuable as a safeguard for Diesel fuels, but it is also equally as efficient for Diesel lubricating oil purification. On turbine driven ships it is a permanent protection to turbine bearings, and is a vital factor in prolonging their life and securing continuously dependable performance from the turbine.

Let Sharples Engineers give you the interesting facts they have compiled on centrifugally purifying turbine lubricating oils, and Diesel fuels and lubricating oils.

THE SHARPLES SPECIALTY CO.
2300-2316 Westmoreland Street
Philadelphia

Representatives in all principal industrial territories

FOREIGN OFFICES

Super Centrifugal Engineers, Ltd
Imperial House, Kingsway,
London, W. C. 2, England

Ste. Ame des Appareils Centrifuge,
8 Rue du Helder,
Paris, France

Tatsumi Commercial Corporation,
Marine Insurance Building,
Tokio, Japan

SHARPLES Presurtite Super Centrifuge

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The Significance of the

WORTHINGTON
DOUBLE-ACTING TWO-CYCLE
OIL ENGINE
(Diesel Type)

SEE NEXT PAGE

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STEAM PLANT
2900 hp.—80 r.p.m.
LENGTH of machinery space . . 63 FEET
WEIGHT of machinery excluding piping . . 510 TONS
B.t.u. per b.hp. per hr. . . 21,000
DIESEL ENGINE PLANT
4-CYCLE SINGLE-ACTING
2900 hp.—95 r.p.m.
LENGTH of machinery space . . 66 FEET
WEIGHT of machinery excluding piping . . 710 TONS
B.t.u. per b.hp. per hr. . . 7,500
WORTHINGTON
OIL ENGINE PLANT
DOUBLE-ACTING TWO-CYCLE
OIL ENGINE (DIESEL TYPE)
2900 hp.—95 r.p.m.
LENGTH of machinery space . . . . . 42 FEET
WEIGHT of machinery excluding piping . . . . 400 TONS
B.t.u. per b.hp. per hr. 7,500
Combining the BEST of each

WORTHINGTON
DOUBLE-ACTING TWO-CYCLE
OIL ENGINE
(Diesel Type)
WORTHINGTON

WORTHINGTON PUMP AND MACHINERY CORPORATION
115 BROADWAY, NEW YORK, U. S. A.

Please send me your bulletin on the Worthington Double-acting Two-cycle Oil Engine Diesel type.

39-0110-2

Name..... *Company*.....

Title..... *Address*.....

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Edison Heavy-Duty Electric Range No. SA163—a small, compact, but highly efficient range especially designed to meet requirements for reconditioned ship installations

EDISON
HEAVY-DUTY
ELECTRIC
EQUIPMENT

The Range That Meets the Diesel Ship Converting Program

ELECTRICITY can be generated at low cost by the oil engines on a Diesel-converted ship. It is, therefore, a move for economy and efficiency to install Edison electric galley equipment when the Diesel reconditioning work is done. This plan makes it unnecessary to carry special fuel for the galley, lessens the displacement and gives all the other electric galley advantages.

For the special purpose of electric galley installation on reconditioned ships we have designed our No. SA163 Marine Range. This is a new, compact range which can be moved through any doorway aboard ship and readily installed in limited spaces.

This new range is just as efficient as the large marine model and offers the same advantages of cleanliness, easily ventilated galleys placed anywhere, reduced labor in attendance, space economy, uniform heat perfectly controlled at all times, together with better, more wholesome cooking with less food waste.

Every marine architect or owner of a ship planning reconditioning should investigate this range before deciding on galley equipment. Our engineers will gladly counsel with you.

EDISON ELECTRIC APPLIANCE CO., Inc.
5666 West Taylor Street : Chicago, Illinois
BOSTON · NEW YORK · CLEVELAND · CHICAGO · ST. LOUIS · ATLANTA · SALT LAKE CITY · ONTARIO, CALIF.
Factories: Chicago, Illinois, and Ontario, California
Canadian General Electric Company, Ltd., *Head Office:* Toronto

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S. S. ROBIN GOODFELLOW, Seas Shipping Corporation, New York, Owners, 10,400 D.W.T. Fitted with Elesco Superheaters to give 100 to 125 deg. superheat.

Another Example of Economical Performance Using Highly Superheated Steam

In traveling 125,000 knots the S. S. Robin Goodfellow has averaged 11.3 knots on 185 bbl. of fuel per day while developing 3000 hp.—or 0.87 lb. of fuel per horse power and less than 0.7 bbl. per knot.

In port, working cargo, 8 hrs. a day, with all winches (10) running, this ship burns about 25 bbl. of fuel per day.

For the past two years, she has used an average of only 600 gal. of lubricating oil per year for all purposes—main units, dynamos, winches, etc.

The only repairs required during the past four years, in which she traveled about 170,000 miles were slight repairs in three superheater units.

THE SUPERHEATER COMPANY

17 East 42nd Street
NEW YORK

Peoples Gas Building
CHICAGO

Canada: The Superheater Company, Limited, Montreal

Todd Shipyards Corporation licensed by the Superheater Company under Schmidt and other patents

82,000,000 HORSEPOWER EQUIPPED IN LOCOMOTIVE, STATIONARY AND MARINE SERVICE

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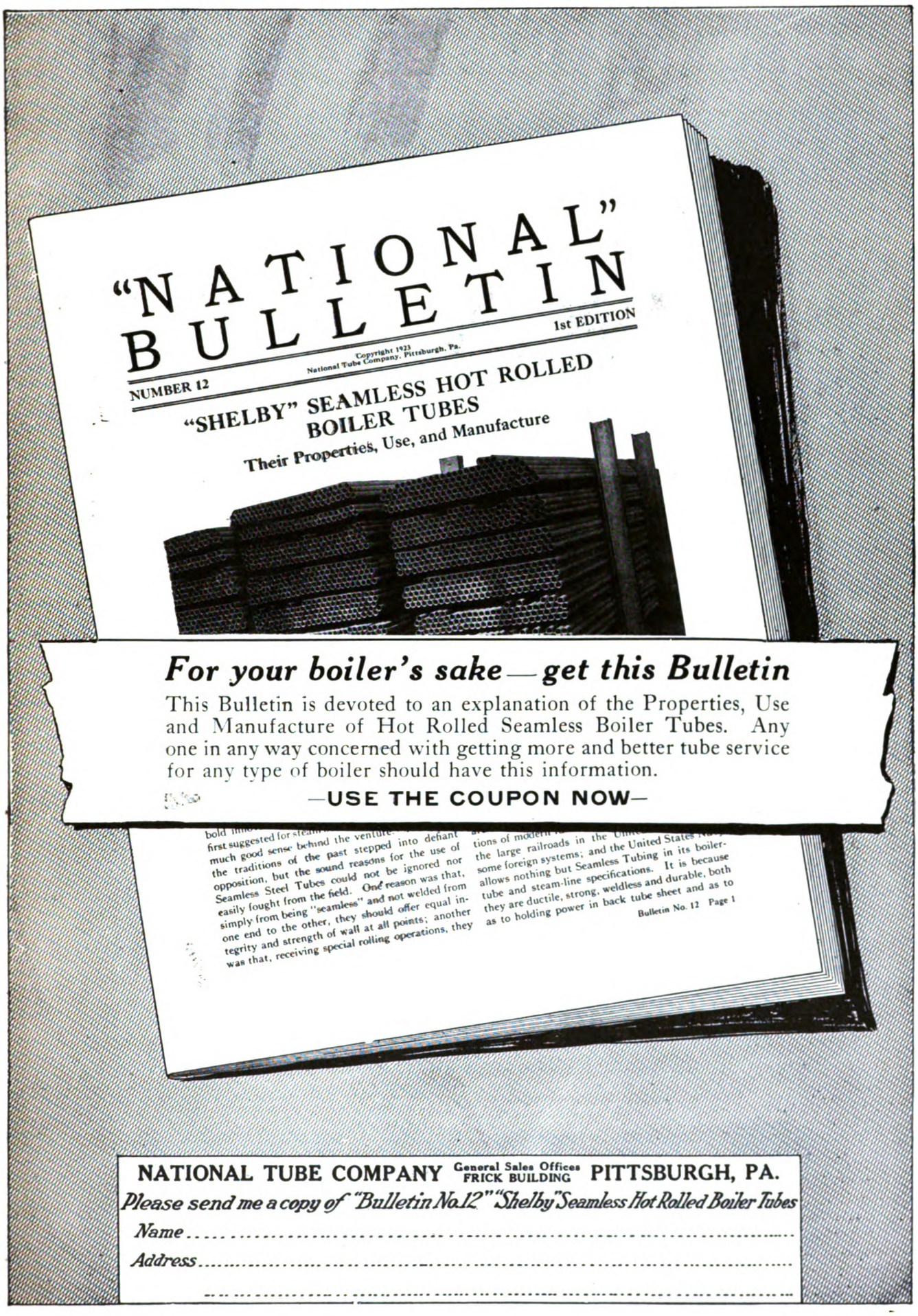
"NATIONAL" BULLETIN
1st EDITION
Copyright 1923 National Tube Company, Pittsburgh, Pa.
NUMBER 12
"SHELBY" SEAMLESS HOT ROLLED BOILER TUBES
Their Properties, Use, and Manufacture
For your boiler's sake—get this Bulletin
This Bulletin is devoted to an explanation of the Properties, Use and Manufacture of Hot Rolled Seamless Boiler Tubes. Any one in any way concerned with getting more and better tube service for any type of boiler should have this information.
—USE THE COUPON NOW—
much good sense behind the venture
the traditions of the past stepped into defiant
opposition, but the sound reasons for the use of
Seamless Steel Tubes could not be ignored nor
easily fought from the field. One reason was that,
simply from being "seamless" and not welded from
one end to the other, they should offer equal in-
tegrity and strength of wall at all points; another
was that, receiving special rolling operations, they
the large railroads in the
some foreign systems; and the United States
allows nothing but Seamless Tubing in its boiler-
tube and steam-line specifications. It is because
they are ductile, strong, weldless and durable, both
as to holding power in back tube sheet and as to
Bulletin No. 12 Page 1
NATIONAL TUBE COMPANY General Sales Offices FRICK BUILDING PITTSBURGH, PA.
Please send me a copy of "Bulletin No. 12" "Shelby" Seamless Hot Rolled Boiler Tubes
Name
Address

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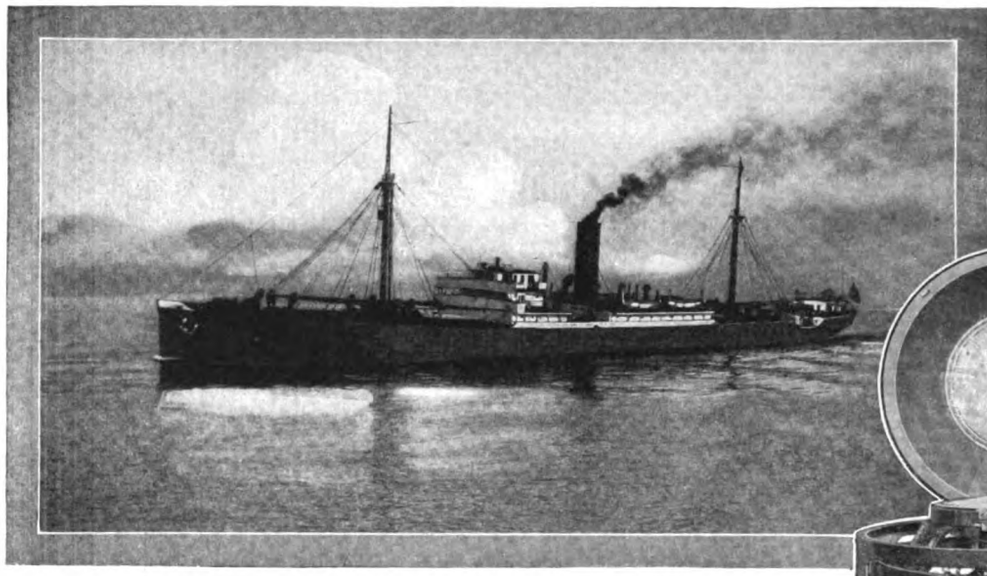
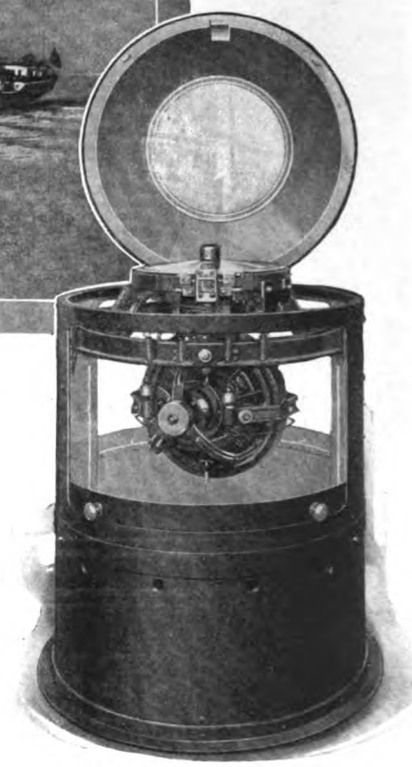
A SEA CAPTAIN'S REPORT





Sperry Master Gyro-Compass

The Skipper of the above World Cruising Ship reports on the Sperry Gyro-Compass

"During one voyage to Honolulu and return from Baltimore and two voyages around the World, steaming a distance of 66,117 miles, crossing the Equator four times, the Gyro-Compass gave perfect satisfaction.

"On the present voyage from Philadelphia to Boston, through the Panama Canal to Los Angeles, a distance of 5,453 miles, at no time during the voyage was there one minute error. Always true—no variation—no deviation to apply, ever true, day or night—sunshine or rain—snow or fog."

Such testimonials from the service prove not only the ruggedness in design and accuracy in operation of the Sperry Gyro-Compass, but its value as an instrument of navigation.

Navigating true by the Gyro-Compass, increases efficiency, raises the safety factor, and results in general economy in ship operation.

THE SPERRY GYROSCOPE COMPANY

LONDON	NEW YORK	TOKYO
15 Victoria Street, S. W. 1	Manhattan Bridge Plaza Brooklyn	Mitsui Building

SPERRY

FOR BETTER NAVIGATION

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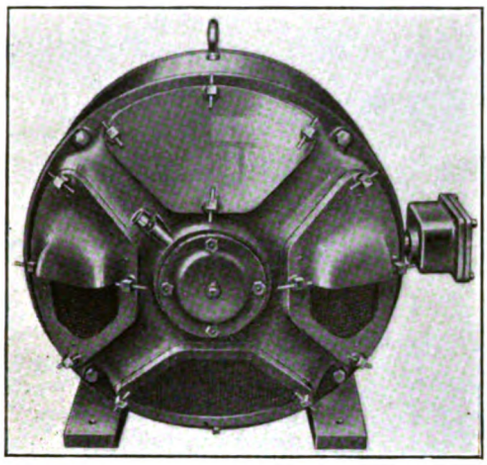

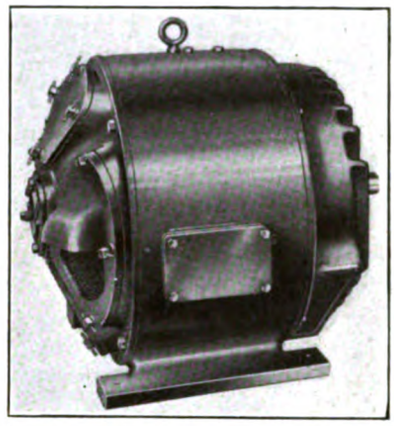

Diehl Marine Type Motor

This is the motor that is winning the confidence of marine engineers who have changed from steam to electric drive for ship's auxiliaries.

Strong and rugged to stand rough service. Ball bearings enclosed and protected. Grease cup lubrication.

Protection against dirt and moisture.

Can be made watertight or drip proof as desired.

Non-corrodible fittings and small parts.

Large hand holes and strong covers on flat surfaces.

Waterproof external connection box—no exposed wires.

Mica insulation—the best in the world to stand service in hot, damp machinery spaces.

And finally—Service to the shipbuilder and operator. Our deliveries are prompt, and our response to requests is as quick as we can make it.

When asking for quotations do not overlook the

DIEHL MANUFACTURING COMPANY

MARINE DEPT. **ELIZABETH, N. J.**

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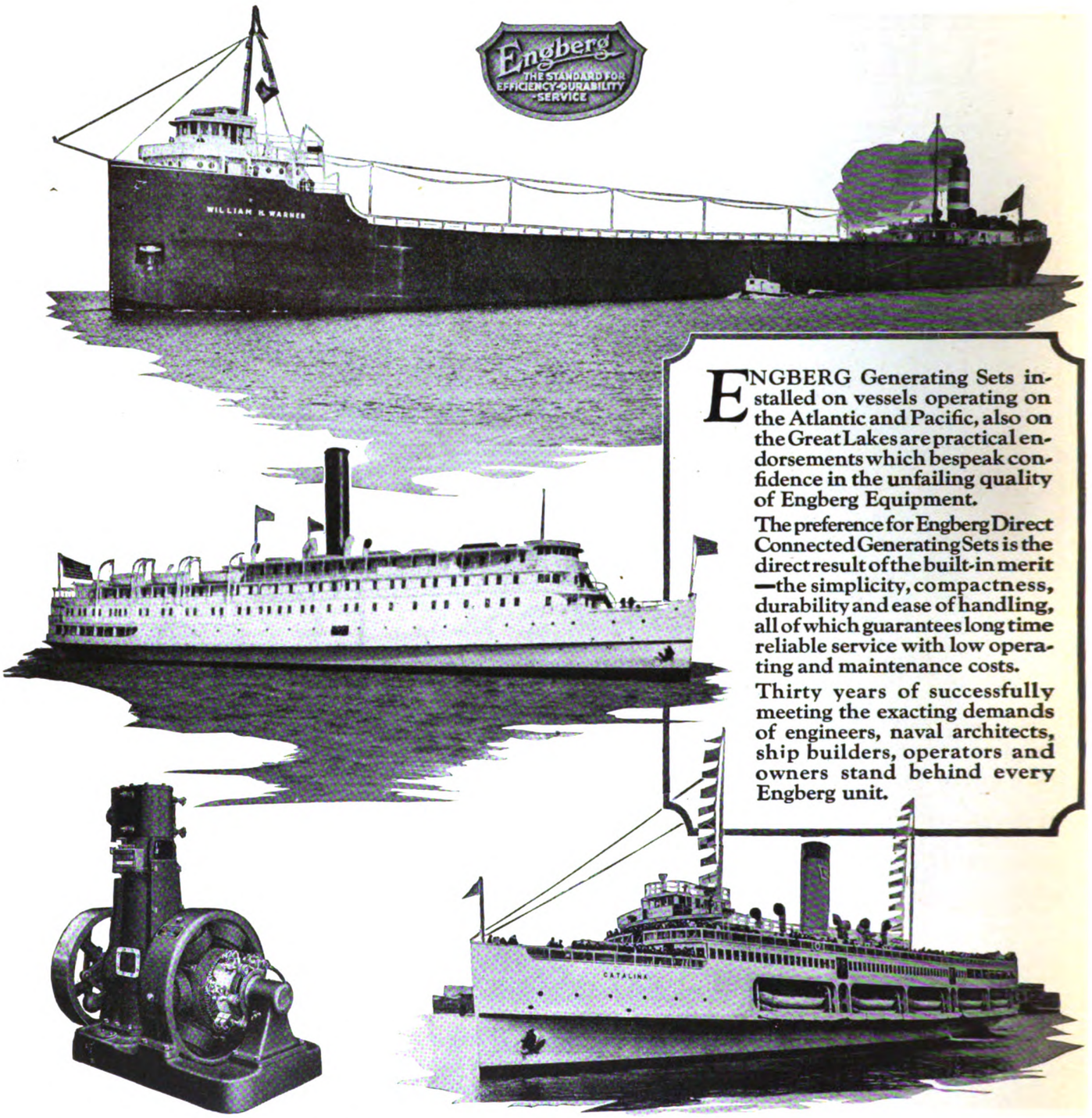

ENGBERG Generating Sets installed on vessels operating on the Atlantic and Pacific, also on the Great Lakes are practical endorsements which bespeak confidence in the unfailing quality of Engberg Equipment.

The preference for Engberg Direct Connected Generating Sets is the direct result of the built-in merit —the simplicity, compactness, durability and ease of handling, all of which guarantees long time reliable service with low operating and maintenance costs.

Thirty years of successfully meeting the exacting demands of engineers, naval architects, ship builders, operators and owners stand behind every Engberg unit.

ENGBERG'S ELECTRIC & MECHANICAL WORKS

6 Vine Street, St. Joseph, Michigan, U. S. A.

ENGBERG

Vertical, Enclosed Self-Oiling, Steam

ENGINES & GENERATING SETS

GENERATORS MOTORS SWITCHBOARDS

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Keeping Rope Expense Down

SAFETY at sea and the economy of operations involving the use of rope are two ever-present factors for consideration in the purchase of marine cordage.

That is why so many of the largest operators regularly specify and use Plymouth Manila Towlines and Hawsers; they have long demonstrated them to be a standardized product yielding the biggest returns in service and dependability.

For salvage work, wrecking and towing, marine construction, cargo falls and running rigging, Plymouth Manila Rope stands foremost in quality, utility and all-round satisfaction.

PLYMOUTH CORDAGE COMPANY

North Plymouth, Mass. Welland, Canada

Carried by Ship Chandlers at All Principal Ports

PLYMOUTH *The Rope You Can Trust*

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Diamond Soot Blowers *increase the boiler efficiency of City of Birmingham*

Another of the 80 American Steamships equipped with Diamond Soot Blowers in 1923.

The exacting demands of continuous coastwise service between New York City and Savannah means that the boilers of the City of Birmingham must be absolutely dependable.

Diamond Soot Blowers were installed because they assure a saving of 4 to 8 per cent fuel with a consequent increase in overall boiler efficiency of 3 or 4 per cent or more. This, of course, also means increased speed if the greater steaming capacity of boilers is utilized.

Write for Bulletin
"Increasing Marine Profits"

New York Address: 90 West St.

DIAMOND POWER SPECIALTY CORPORATION
DETROIT, MICHIGAN

Savannah Line

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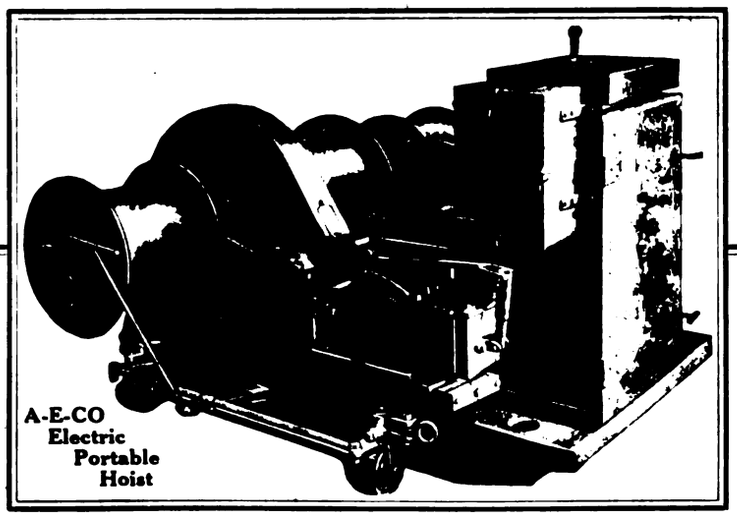
A-E-CO Electric Portable Hoist

Saves Cargo Handling Time

The A-E-CO Electric Portable Hoist, shown above, speeds up the loading and unloading of cargo. It therefore lowers wharfage and stevedoring charges and, by reducing the ship's idle time in port, adds materially to its earning capacity.

It handles loads from 1700 to 7000 lbs. at a speed of 150 feet per minute. Yet it is remarkably efficient and economical of power.

It is portable. The entire equipment including motor, resistance, controller and overload protection, is mounted on a single bed-plate and can easily be moved by two men.

It is unfailingly dependable and always ready to meet the most severe demands.

This is a popular member of the A-E-CO line of hoists and winches which includes steam, electric, electro-hydraulic, gasoline and hand operated types. Every cargo-handling requirement on ship or dock is met in this comprehensive line which is backed by over sixty years' experience in the design and manufacture of ship machinery.

The new catalog—recently issued—gives descriptions and illustrations of the various types of A-E-CO Hoists and Winches. Every ship builder and ship-owner should have a copy. Write for yours—today!

American Engineering Company

Aramingo and Cumberland Streets, Philadelphia, Pa.

Boston—New York—Philadelphia—New Orleans—Cleveland—San Francisco

A-E-CO

Dependable Marine Auxiliaries

Steerers Hoists Capstans Towing Machines
Telemotors Winches Gypseys Windlasses

"The Choice of the Old Timers"

Send for Catalogs of the Auxiliaries in which you are interested

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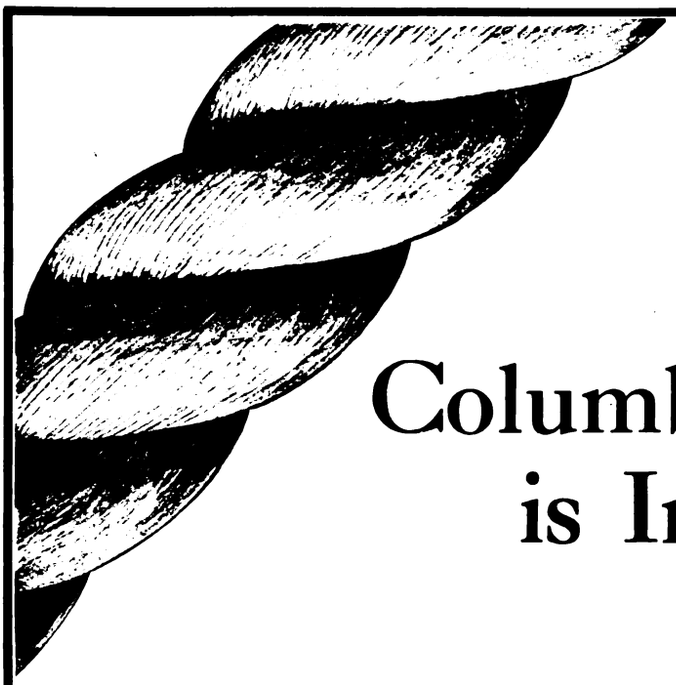


Columbian Quality is Invariable

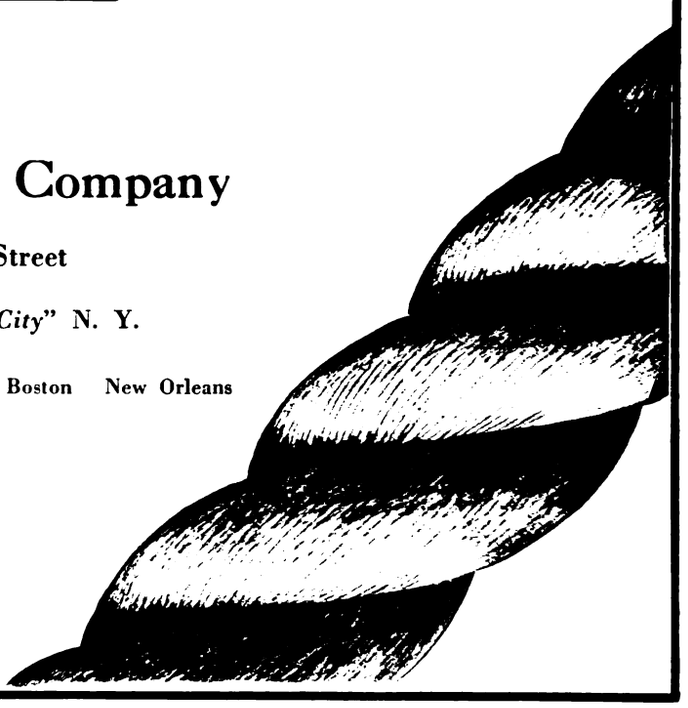
One of the finest compliments ever paid to a Columbian product was recently received from a satisfied consumer. He wrote that his reason for insisting upon Columbian *Tape-Marked* Rope is because every Columbian Rope is the same. He has been using large quantities of the Guaranteed *Tape-Marked* Rope for several years, and has never experienced the slightest deviation from the high standard of quality.

Columbian Rope Company

372-90 Genesee Street

Auburn, "*The Cordage City*" N. Y.

Branches: New York Chicago Boston New Orleans



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On the J.W.Van Dyke

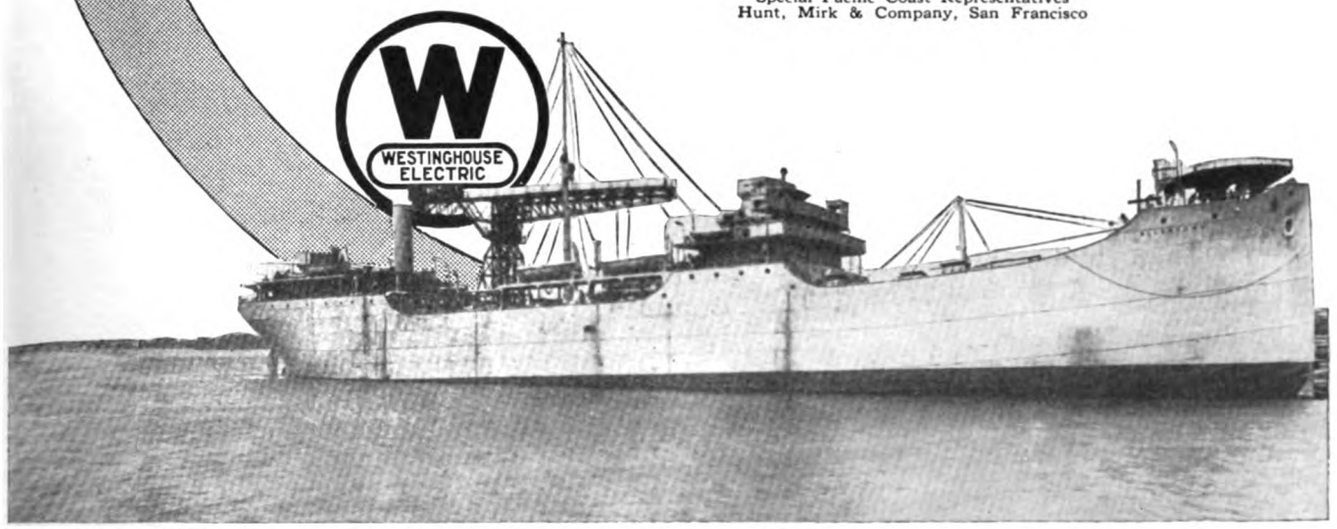
WESTINGHOUSE electrical equipment has been selected by the Atlantic Refining Company for the conversion to Diesel-Electric drive of the 8000 ton tanker, ***J. W. Van Dyke,*** formerly the United States Shipping Board Ship, ***Allentown.*** This is the largest ship, in point of dead weight tonnage, yet under contract for conversion to Diesel-Electric drive.

Power for propulsion and auxiliaries will be supplied by three 600 kw. Diesel-driven Westinghouse generators with 50 kw. exciters. The single propelling motor is to be a 2300 shp., double armature Westinghouse motor, controlled directly from the pilot house by the Ward-Leonard system.

In port, one of the main generator sets is switched from the propelling circuit to the pump circuit, and supplies the pump motors, which handle the 60,000 barrels of oil. This illustrates the flexibility and economy of the Diesel-Electric System.

For conversion or construction, Westinghouse engineers will gladly cooperate with you to lay out the most efficient electrical equipment for your ship.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in Principal American Cities
Service Stations in Principal American Ports
Special Pacific Coast Representatives
Hunt, Mirk & Company, San Francisco



Westinghouse

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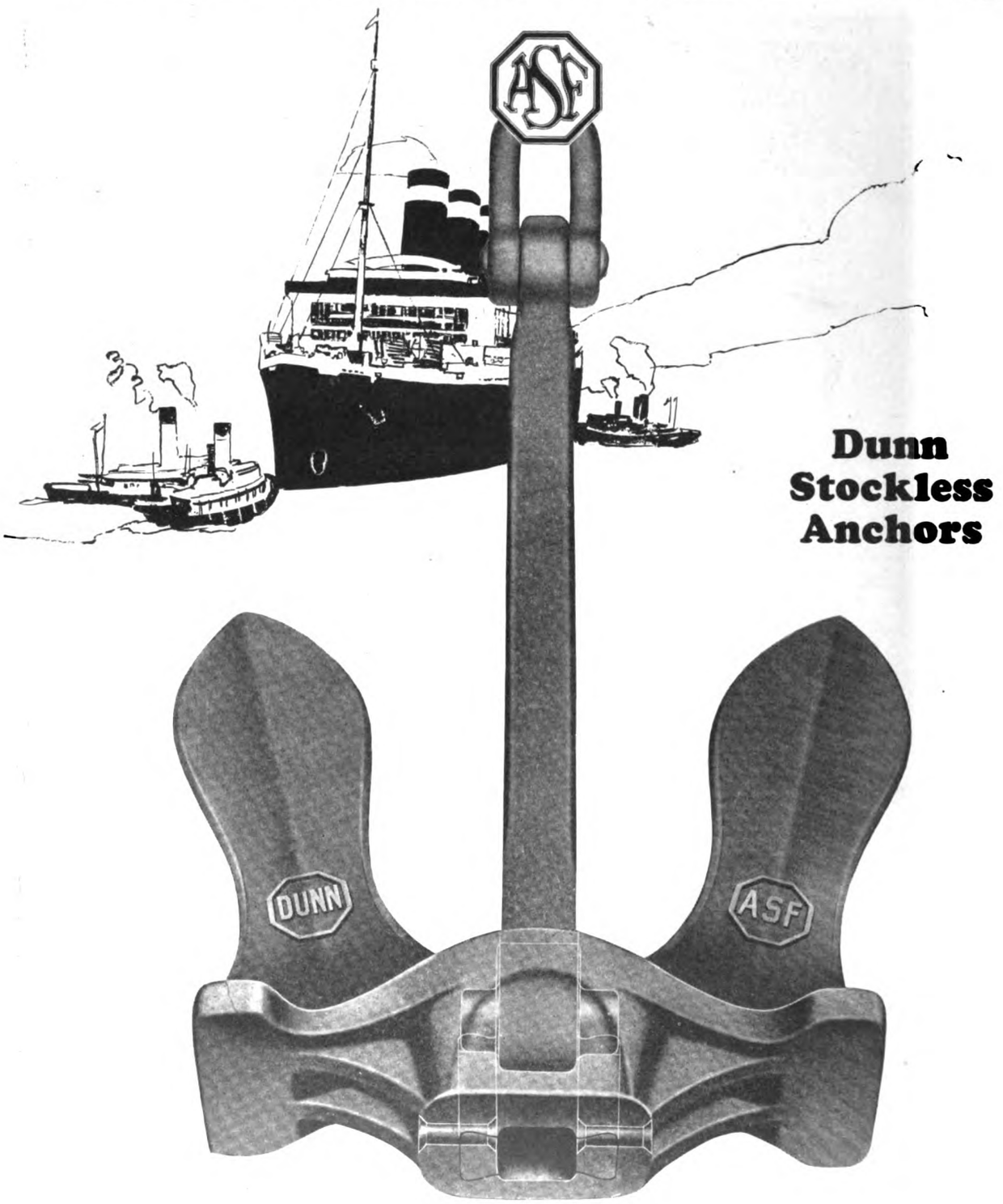
AMERICAN STEEL FOUNDRIES



Dunn Stockless Anchors

NEW YORK CHICAGO ST. LOUIS

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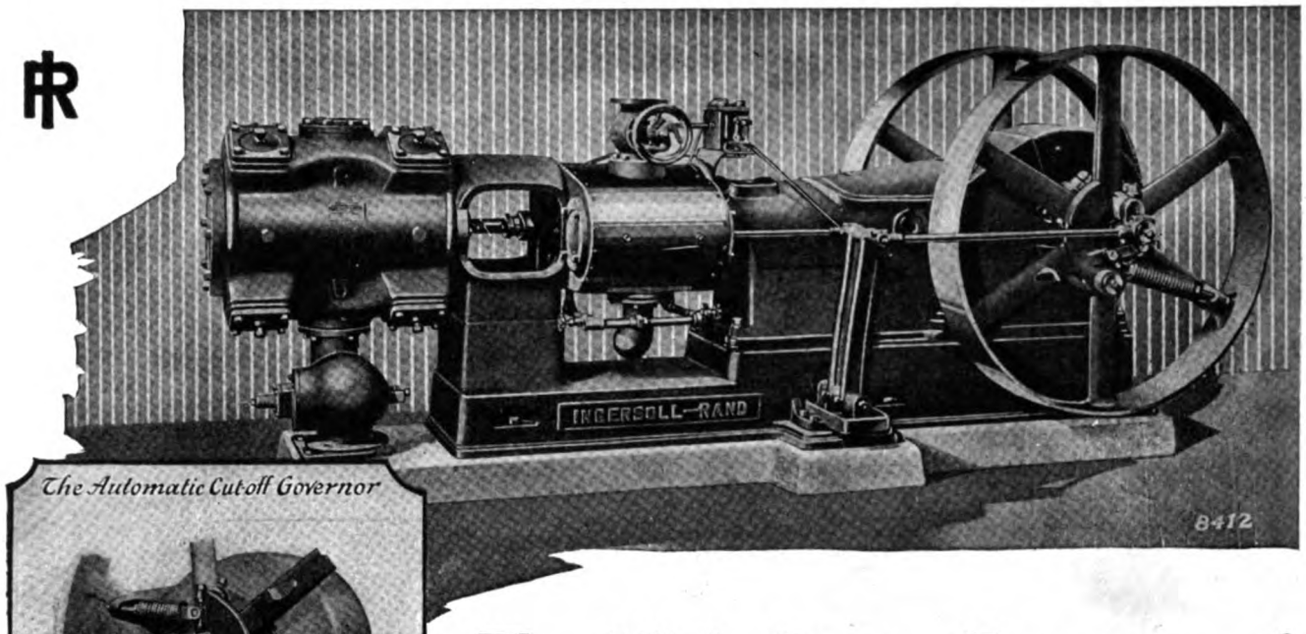

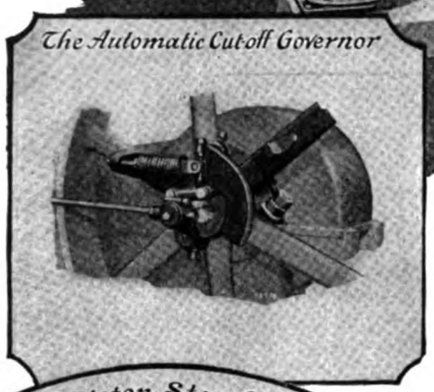

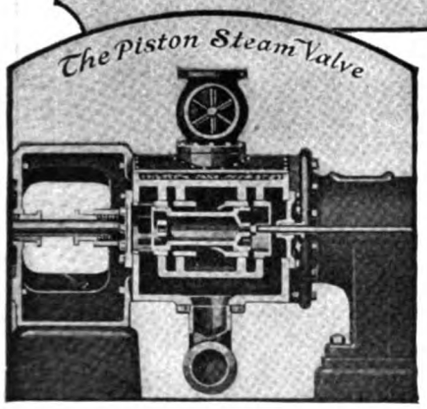

Class FR compressors are described in detail in Bulletin 3050. Send for your copy now.

The High Steam Economy of Class "FR" Air Compressors

The Cutoff Fly-wheel Governor automatically performs the following functions:

Varies the position of steam cutoff to meet any changes in air load or boiler pressure.

Maintains a constant compressor speed under all conditions. It has hand adjustment provided for adjusting the speed to anything between full and one-half rated speed.

The Balanced Piston Steam Valve is of special design for use of high steam pressure and superheat. It will not warp nor leak causing lubrication troubles and wastage of steam.

The Class "FR" Piston Valve will also operate with high economy under ordinary saturated steam conditions.

These and other features make it possible for Class "FR" compressors to operate with unusually high steam economy. In fact, a compressor equipped with ordinary flat valve and throttle governor requires approximately 50% more steam than is used with the same size "FR" machine.

INGERSOLL-RAND COMPANY, 11 BROADWAY, NEW YORK

ATLANTA
BIRMINGHAM
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NEW ORLEANS
NEW YORK
PHILADELPHIA
PITTSBURGH
POTTSVILLE
SAN FRANCISCO
SALT LAKE CITY
SCRANTON
SEATTLE
ST. LOUIS
WASHINGTON

For Canada refer Canadian Ingersoll-Rand Co., Limited, 260 St. James St., Montreal

Ingersoll-Rand

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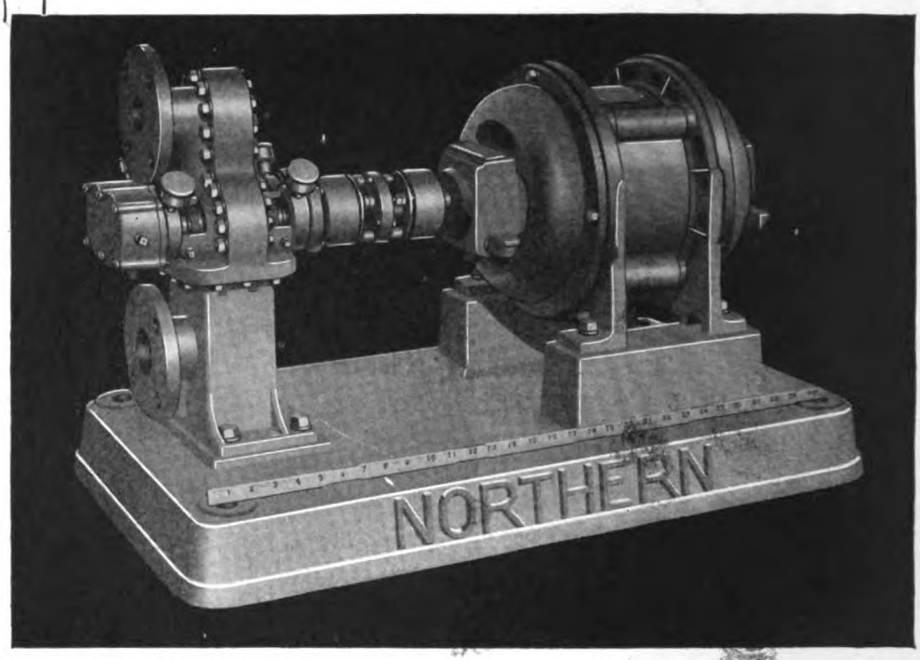
NORTHERN ROTARY PUMPS

"MORE GALLONS PER HORSE POWER"

Approved by A. B. S.



New style "E" series NORTHERN Rotary Pump with 3 H.P. 1150 R.P.M. General Electric Motor. Duty 30 G. P. M. against 113 lbs.

For Efficient Pumping Service—

Offices:

Hayes Pump & Machinery Co.,
94 Pearl Street,
Corner of High Street,
Boston, Mass.

Cameron & Barkley Co.,
Charleston, South Carolina,
Tampa, Miami and Jacksonville,
Fla.

Northern Fire Apparatus Co.,
51 East 42nd Street,
New York City

Northern Fire Apparatus Co.,
428 Bulkley Bldg.,
Cleveland, Ohio

Warren C. Graham,
411 Godchaux Bldg.,
New Orleans, La.

Dan T. Moore,
423 West Bldg.,
Houston, Texas

Hodgart & Company,
Peoples Gas Bldg.,
Chicago, Illinois

H. M. Stark Machinery Co.,
909 Kresge Bldg.,
Detroit, Mich.

Equipment Sales Co.,
610 Erie County Bank Bldg.,
Buffalo, N. Y.

King Knight Co.,
San Francisco, Cal.
Los Angeles, Cal.

THE high records of efficiency and economy which this NORTHERN Rotary Pump had made on varied marine pumping duties demand careful consideration in choosing pumping equipment for new ships.

NORTHERN Pumps are compact and sturdy. They save space without sacrificing volume. They are adapted to either electric or steam turbine drive.

Patented lateral ports prevent pulsation. The rotors are driven by pilot gears outside the casing; both water gears are driven gears. Packing strips in the rotor teeth automatically feed out as they wear and maintain perfect contact with the cylinder walls.

Complete information about NORTHERN Pumps will be sent on request. In writing, tell us about your particular problems. Our engineering department will be glad to help you solve them.

NORTHERN PUMP CO.

DIVISION OF
NORTHERN FIRE APPARATUS CO.
MINNEAPOLIS MINNESOTA, U.S.A.
914 18th AVE., N. E. MINNEAPOLIS, MINN.

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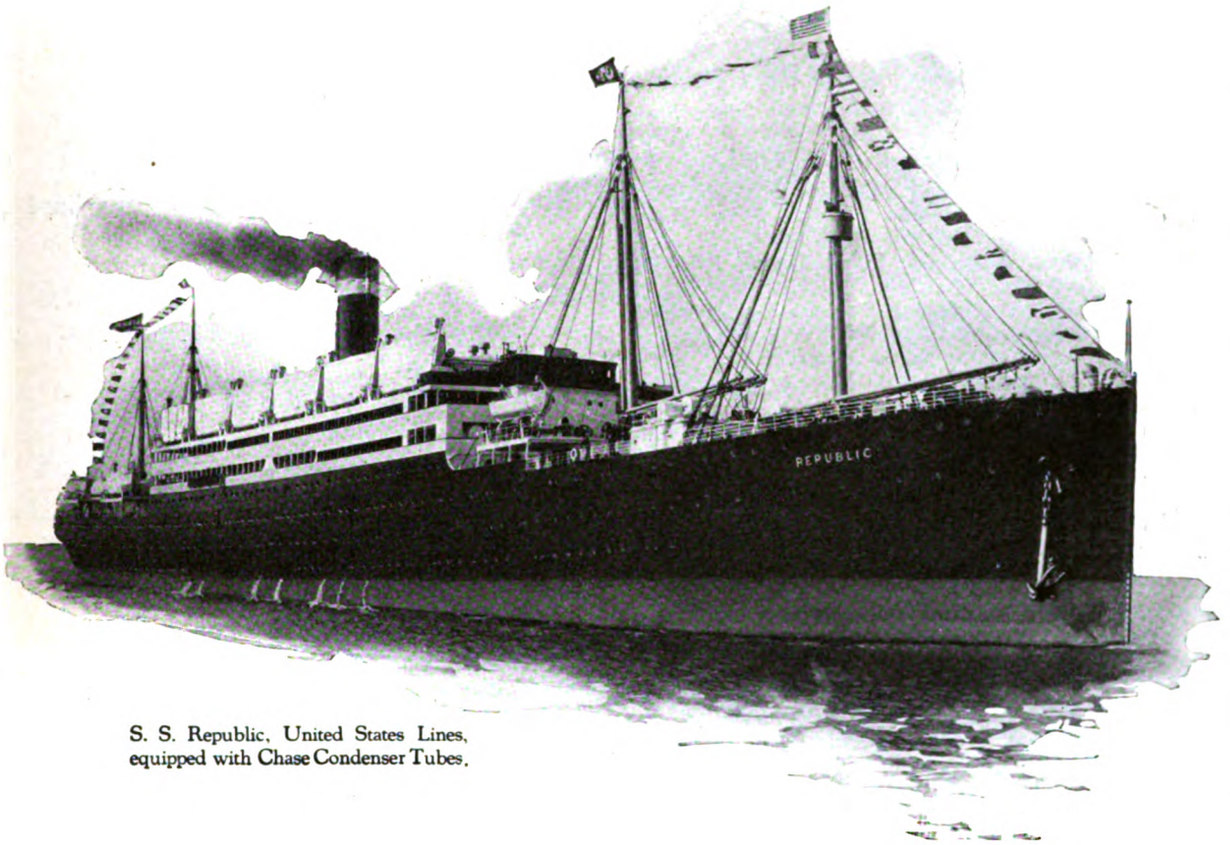
CHASE CONDENSER TUBES
for the United States Lines



S. S. Republic, United States Lines, equipped with Chase Condenser Tubes.

CHASE CONDENSER TUBES are doing their bit helping the American Merchant Marine maintain its service to American economic independence. Under present difficult competitive conditions the dependable, long-life service of Chase Condenser Tubes is doubly important to shipping men.

CHASE METAL WORKS
Division of Chase Companies Inc.
WATERBURY CONNECTICUT
PLANTS
CHASE METAL WORKS — Trade CHASE Mark — CHASE ROLLING MILLS

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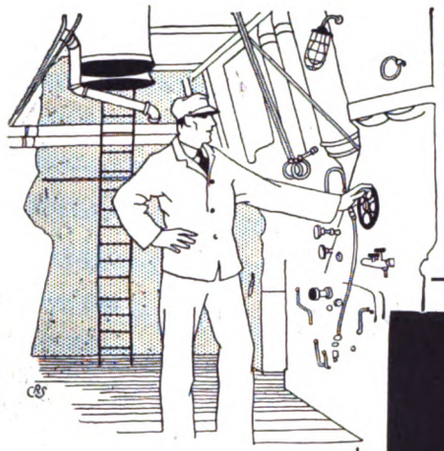
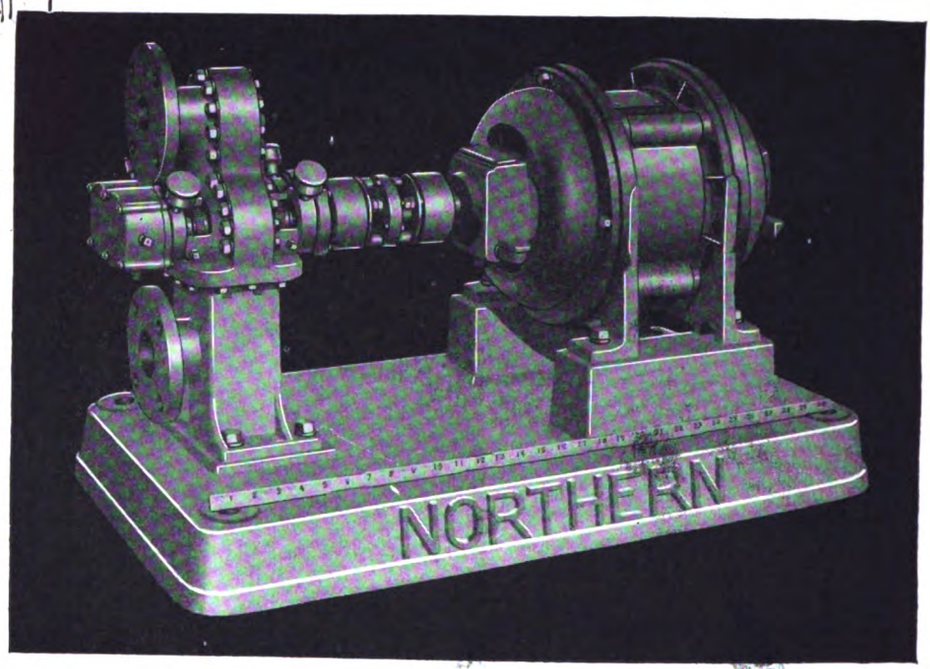


NORTHERN ROTARY PUMPS

"MORE GALLONS PER HORSE POWER"

Approved by A. B. S.



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DIVISION OF
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MINNEAPOLIS MINNESOTA, U.S.A.
914 18th AVE., N. E. MINNEAPOLIS, MINN.

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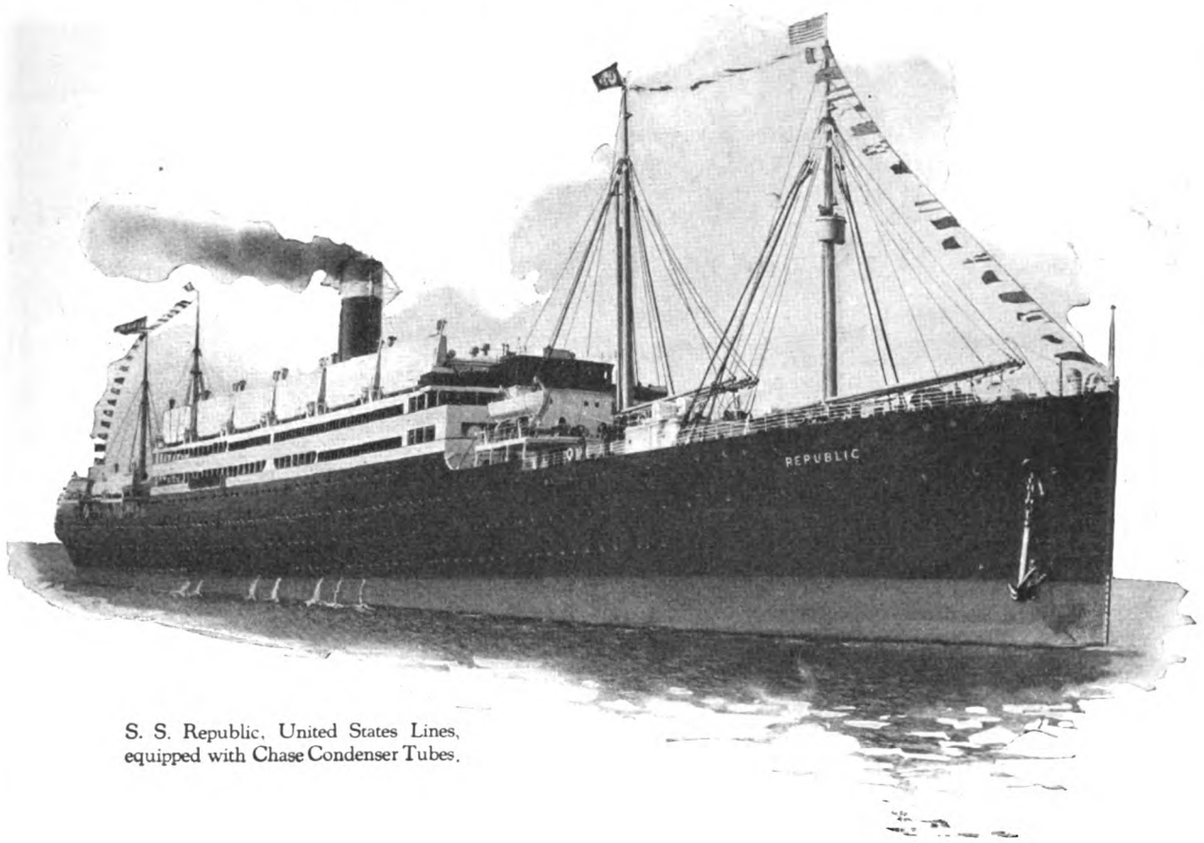
CHASE CONDENSER TUBES
for the United States Lines



S. S. Republic, United States Lines, equipped with Chase Condenser Tubes.

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Published this month—revised edition

Screw Propellers

and Estimation of Power for Propulsion of Ships Also Airship Propellers

by Rear Admiral Charles W. Dyson

Late Head of Design Department, Bureau of Engineering, U. S. Navy Department

Chapter Headings, Vol. I, Text

Types of Hulls. Normal and Slip Block Coefficients. Thrust Deduction. Power Loss Factor. Power Loss Factor Coefficient. Mean Relative Tip Clearance.

Estimation of Power. Indicated, Shaft, Thrust, Effective (Tow-rope) Horsepower.

Early Investigations for Obtaining Data for the Design of Screw Propellers. Empirical Formulas.

Theoretical Treatment of the Screw Propeller.

Practical Methods of Design. Design by Comparison. Taylor's Method. Barnaby's Method.

Third Method of Design: Design Based on Actual Trials of Full-sized Propellers in Service Over Carefully Measured Courses. The Dyson Method.

Cavitation: Cavitation of the Thrust Column—Cavitation Due to Excess Thrusts—Cavitation of the Blade Backs; Cavitation of the Suction Column—Cavitation Due to Excess Tip Speeds—Cavitation of the Blade Faces.

Design by Method of Comparison: (1) Thrusts Reduced by Law of Comparison; (2) Thrusts Constant.

Standard Forms of Projected Areas of Blades for Use with the Charts of Design.

Analysis of Propellers in Underload and Overload Conditions but Out of Cavitation of the Thrust Column.

Problems Illustrating the Effect of Propellers Cavitating Due to Excess Thrusts. Submarines, Analysis of Performances on Surface and When Submerged.

Design of the Propeller: Method of Determining Pitch, Diameter, Projected Area Ratio and Propulsive Efficiency.

Change of Pitch from Designed Pitch, by Twisting Blade on Hub. Effect on Performance of the Propeller Caused by Varying Any of Its Elements.

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Ship and Propeller Data

Barnaby Chart of Propeller Efficiencies

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Chart for S.B.C. and K.B.C.

Appendage Resistance

Chart for Power Loss Factor K.

Chart for Basic Conditions

Chart for Basic Slip

Chart for Z and Z_s

Chart for Cavitation Limits

Chart for Constant Apparent Slip

Chart for I. $T_{.d} \div (I- S)$ and $(E. T._p \times \frac{P.-A.}{D. A.})$

Chart for Projected Area Ratio Forms

Chart for Basic Conditions, Aero Propeller

Chart for Blade Forms, Aero Propeller

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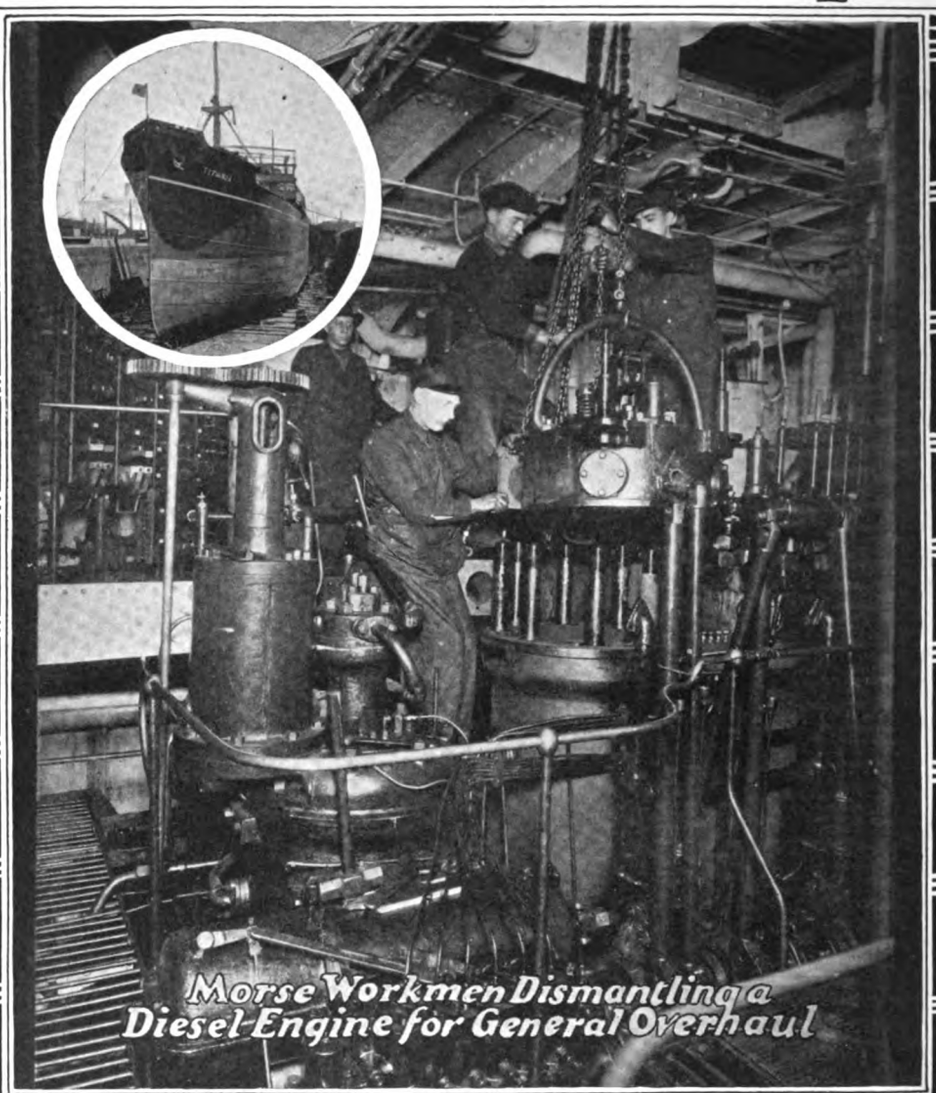

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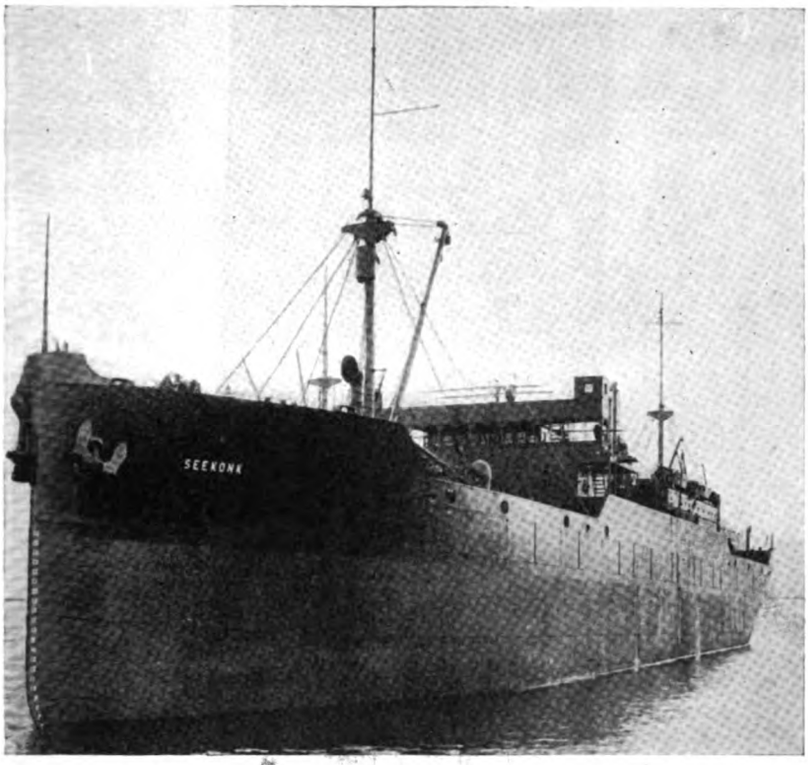

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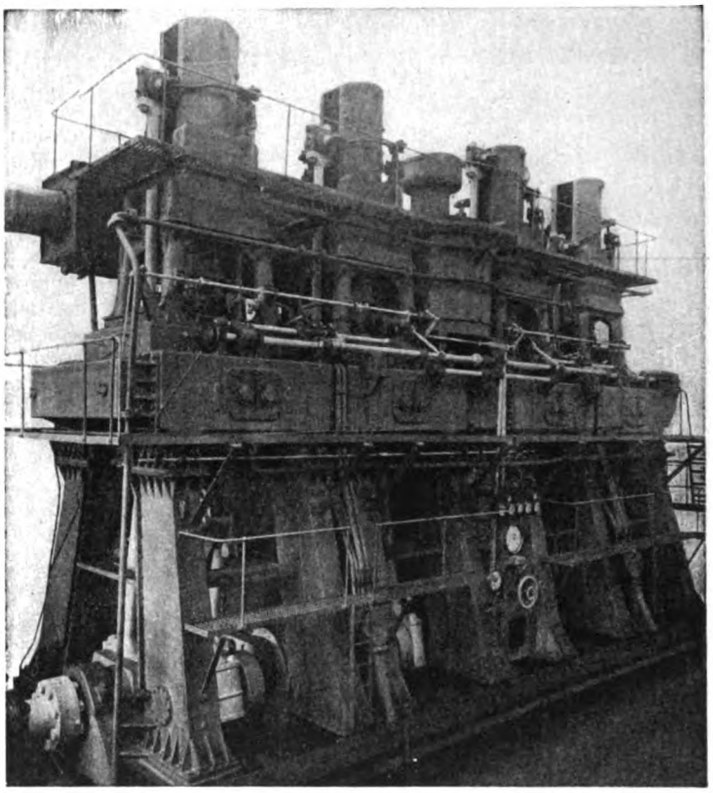

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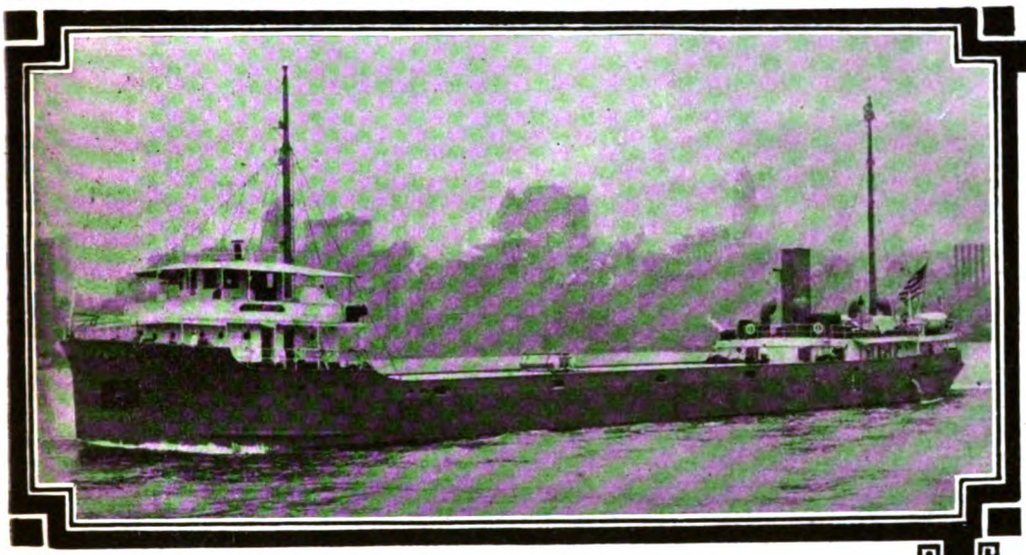

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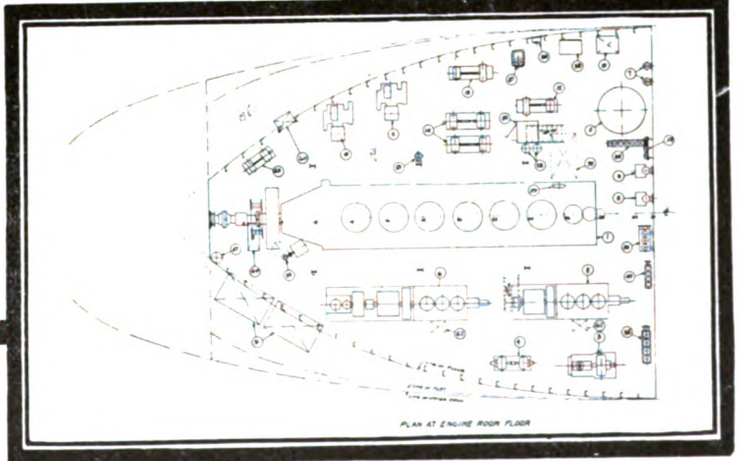

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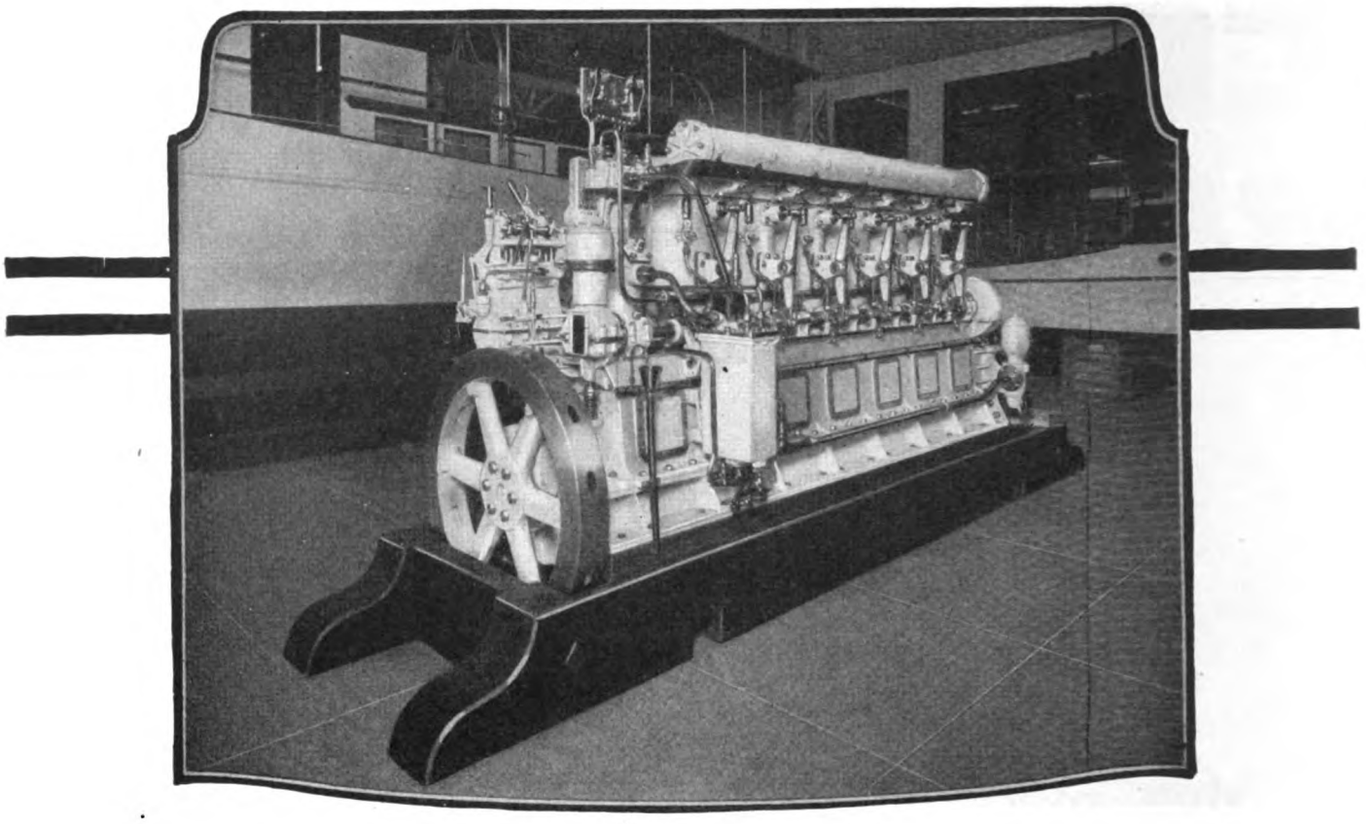

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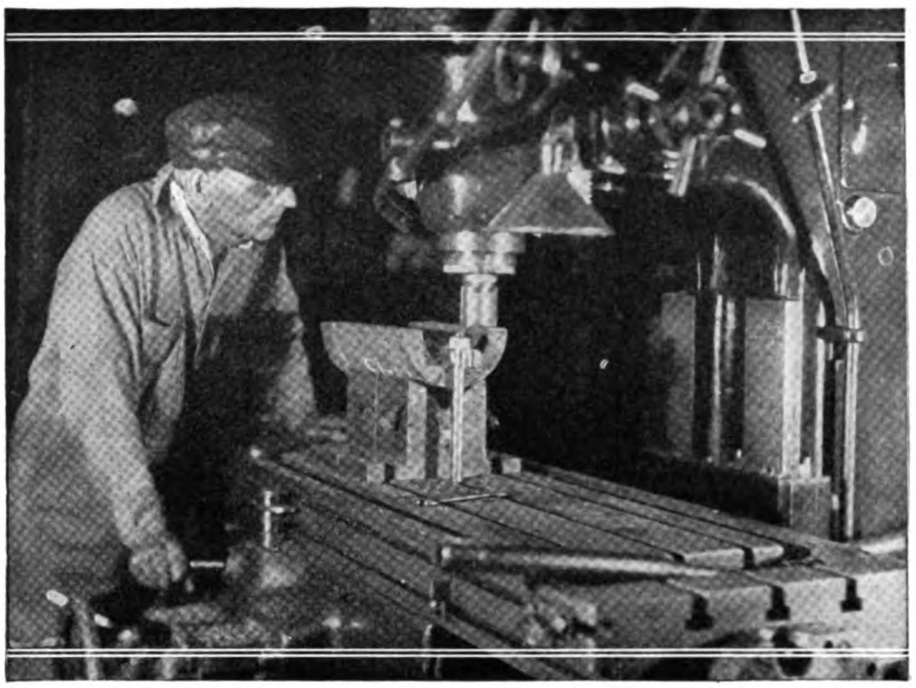

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We have the men, born to their trade, brought up in the machine shop with the smell of machined iron in their nostrils. Many of our men were trained in the European Diesel plants.

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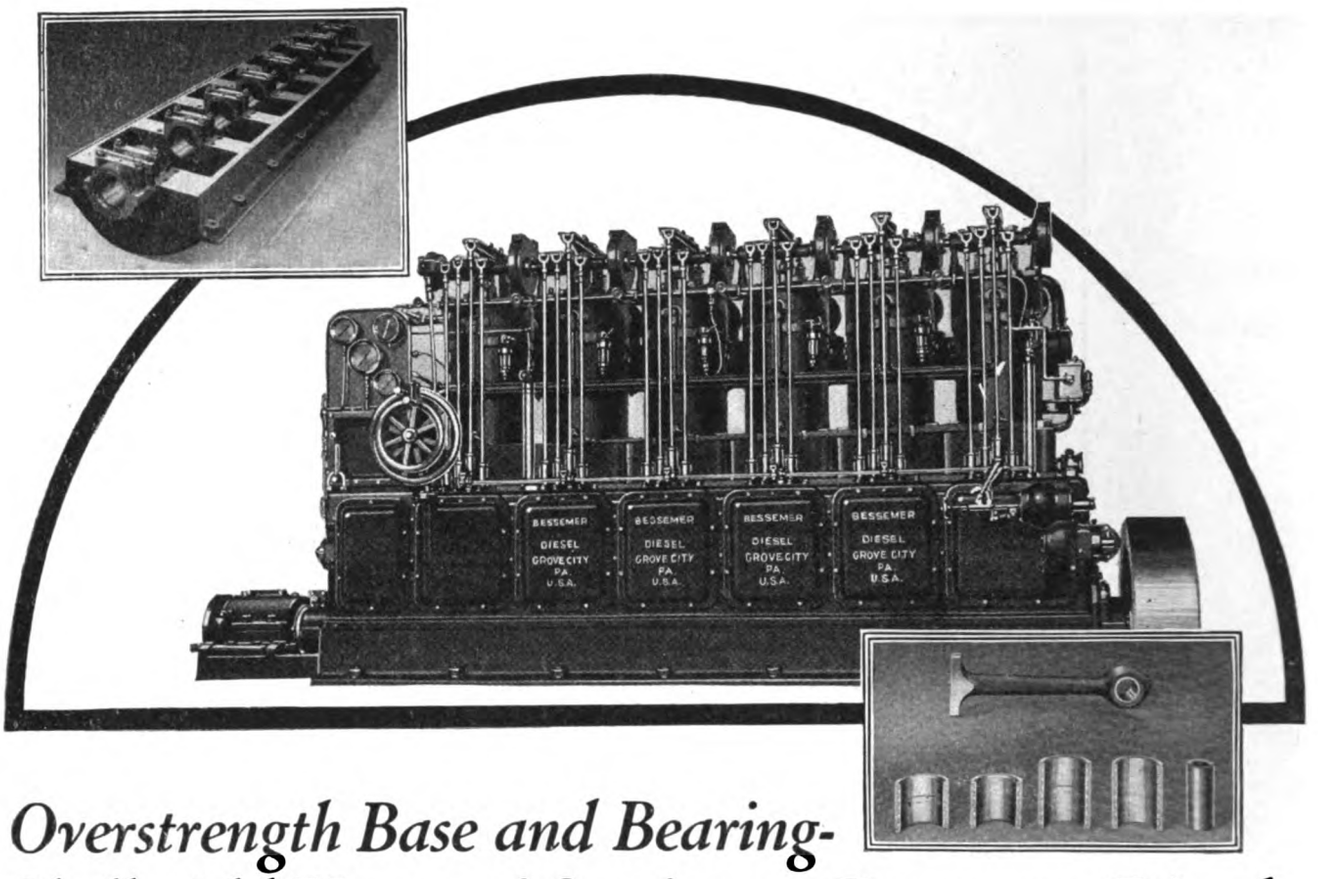

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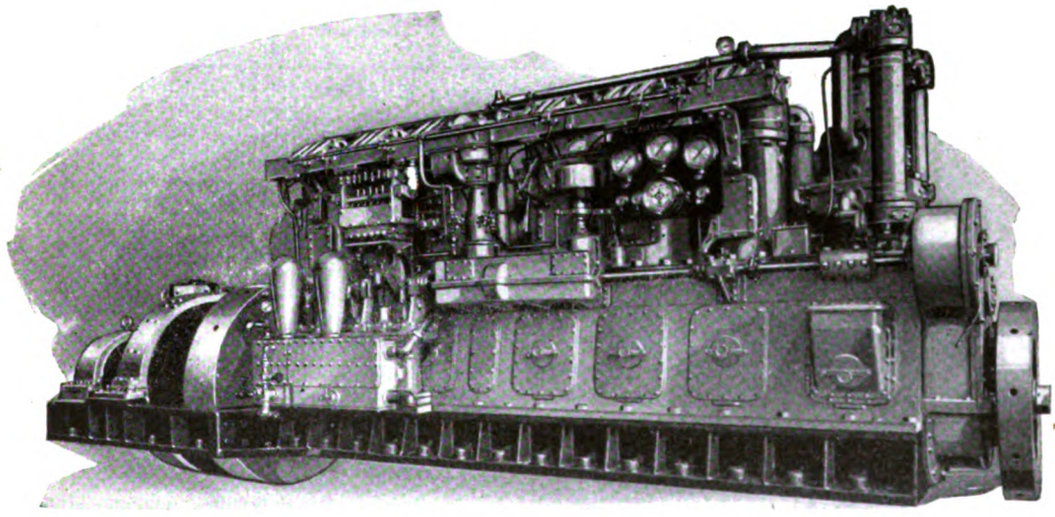

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WINTON DIESEL TYPE OIL ENGINES

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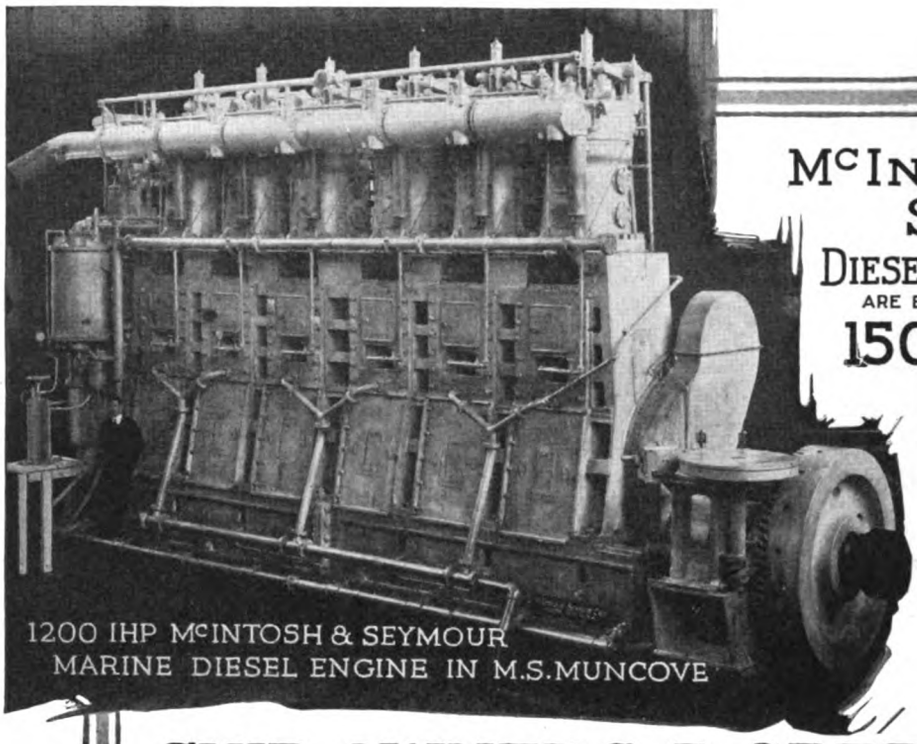

1200 IHP McINTOSH & SEYMOUR MARINE DIESEL ENGINE IN M.S.MUNCOVE

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ARE BUILT IN SIZES FROM

150 TO 8000

INDICATED H.P.

SHIP OWNERS & OPERATORS

PLEASE STUDY THIS TABLE

	COAL FIRED STEAM VESSEL	CONVERTED TO MOTORSHIP WITH STEAM AUXILIARIES	CONVERTED TO MOTORSHIP WITH DIESEL ELECTRIC AUXILIARIES
Deadweight Tons	4125	4125	4125
Average Speed (Knots) . .	8.5	8	8
Average Fuel Per Day (Tons)	28	8	4½
Ton/Miles of Cargo per Dollar Fuel Cost	4300	9300	16,500

The above are actual results compiled from operating data of Sister Shipping Board Ships now operated by a prominent American shipping company.

THE MOTORSHIPS were fitted with

McINTOSH & SEYMOUR DIESEL OIL ENGINES

FOR MARINE SERVICE

FULL PARTICULARS CAN BE OBTAINED FROM

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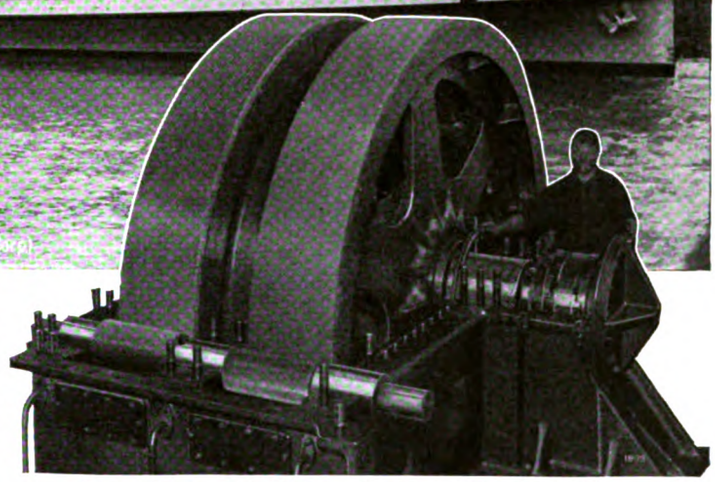
The Finest Passenger Vessels Have De Laval Gears and Turbines

S.S. BOSTON—(Photo by courtesy of the Bethlehem Shipbuilding Corp.)

THE De Laval geared turbine weighs less, occupies less space and is in general more economical than any other type of propelling machinery. Vessels fitted with De Laval equipment make better speed, require less fuel, are easier to handle and are more reliable than those fitted with the older forms of power plant.



Type of gear installed on the steamships BOSTON and NEW YORK

As examples, the following:

MUNARGO, Munson Line, built by New York Shipbuilding Co. for New York-West Indies route; single screw driven through De Laval double reduction gear, 6000 shaft hp.

CARABOBO, built by New York Shipbuilding Co. for Red D Line New York and Venezuela route; twin screws driven by De Laval gears of 2200 total hp.

BOSTON and NEW YORK, built by Bethlehem Shipbuilding Corporation for Eastern Steamship Lines, Inc.; twin screws each driven through 3800 hp. De Laval reduction gears.

BIENVILLE, built by Todd Shipbuilding & Construction Co. for Southern Pacific Line; to be fitted with a De Laval double geared turbine rated at 7100 hp. at 85 r.p.m.

The Federal Shipbuilding Co. has also ordered a 5500 hp. De Laval double geared turbine for a freighter being built for the Southern Pacific Co.

Scout Cruisers RICHMOND and TRENTON, built by William Cramp & Sons Ship & Engine Building Co.; each equipped with four De Laval reduction gears of the two pinion type, designed to transmit 22,500 hp. each; speed 35 knots. The MEMPHIS and two other sister ships soon to be placed in commission are similarly equipped.

Over 150 vessels equipped with De Laval gears or geared turbines have covered an average of over 100,000 miles each, while several have covered over 500,000 miles with completely satisfactory gear operation.

The total horsepower of De Laval gears and turbines in use is over 2,000,000, including passenger ships, oil tankers, cargo ships, battleships, destroyers and scout cruisers.

De Laval geared turbines have replaced triple expansion engines with fuel savings up to 40%, and a considerable reduction in expense for supplies and upkeep.

Ask for Catalog M-46.

396

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Trenton, New Jersey

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POWELL VALVES

TO DO THE WORK REQUIRED OF THEM

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IRON BODY WHITE STAR GATE VALVE
Rising Stem

Will withstand steam working pressure up to 150 and 250 pounds.

Sizes 2 to 16 inches.

Specify POWELL VALVES

The Wm. Powell Co.
CINCINNATI, O.

See Powell Exhibit Space No. 504, National Exposition of Power & Mechanical Engineering, Dec. 1st to 6th, 1924, Grand Central Palace, New York, N. Y.

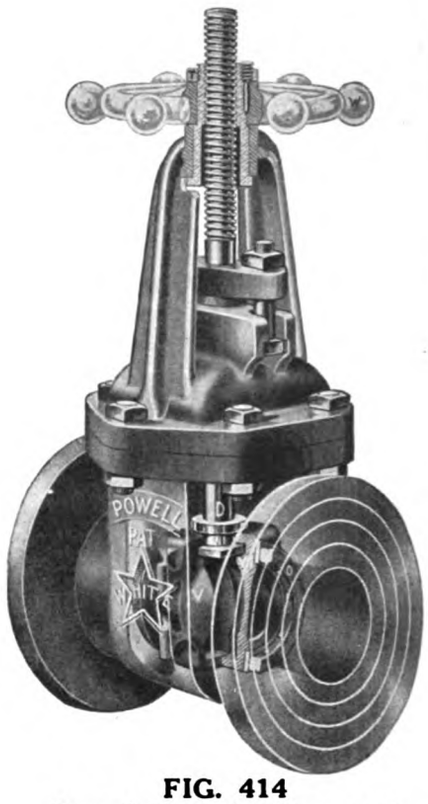
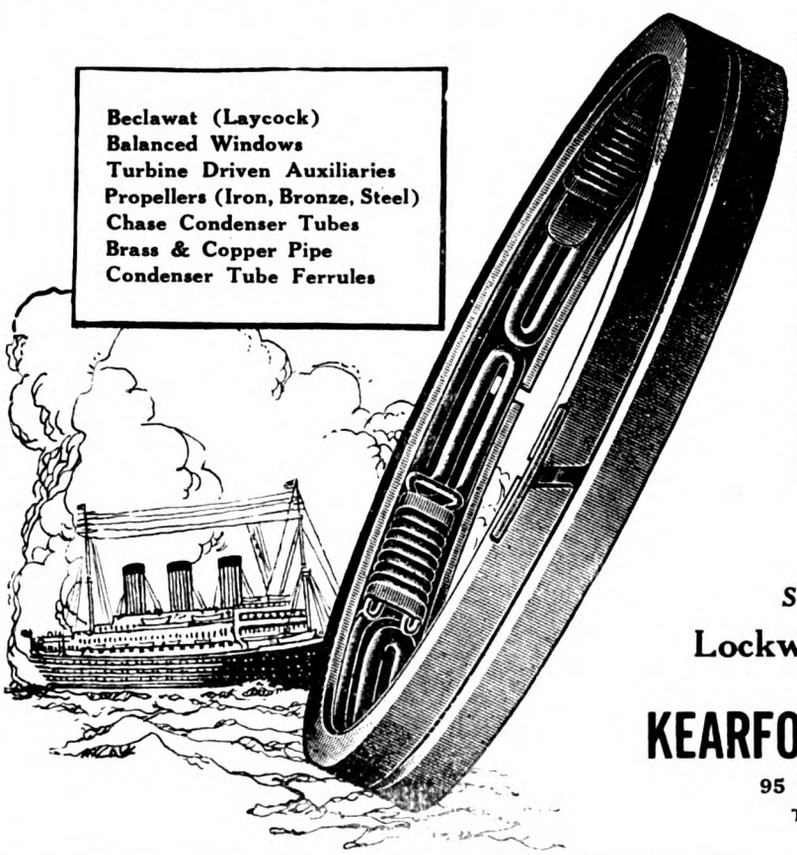


FIG. 414
Descriptive circulars sent on request.

Lockwood & Carlisle Piston Rings and Springs

Beclawat (Laycock)
Balanced Windows
Turbine Driven Auxiliaries
Propellers (Iron, Bronze, Steel)
Chase Condenser Tubes
Brass & Copper Pipe
Condenser Tube Ferrules



ELIMINATING steam and power waste is the one important essential of all packing. Lockwood & Carlisle Piston Packing Rings accomplish this by double acting springs. Their positive action ensures absolute steam-tightness on cylinder walls, on piston and junk ring faces, with minimum friction, thereby combining in the highest degree both operating efficiency and economy.

By a slight modification these rings are made and extensively used for piston valves.

Wherever used in connection with extremely high pressure and intense heat of superheated steam, our special superheat type of packing shows comparative results giving them decided preference.

Each year more shipping lines are overcoming steam and power losses by specifying Lockwood & Carlisle Packing exclusively.

Send for Catalog of Guaranteed Metallic Packing

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Lockwood & Carlisle Packing

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of

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CAR-FLOATS

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WATER TUBE MARINE BOILERS AND SUPERHEATERS

FOR NAVAL AND MERCHANT VESSELS OF ALL CLASSES

Installations total over Six Million Horsepower.

MECHANICAL ATOMIZING OIL BURNERS

FLEXIBLE RELIABLE EFFICIENT

Over Five Thousand Installed in Naval and Merchant Vessels.

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FOR MEASURING SURFACE CONDENSER LEAKAGE, BOILER WATER SALINITY AND OTHER USES.

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FOR AUTOMATICALLY REMOVING OIL FROM BOILER FEED WATER.

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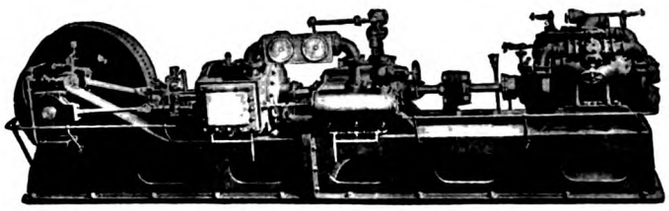
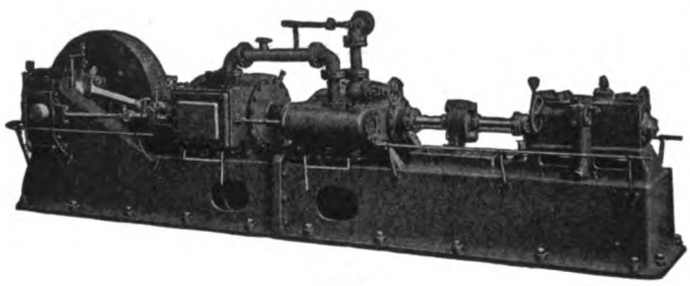
YORK Refrigerating Machinery

FOR MARINE SERVICE



AMMONIA



CO_2

PERISHABLE PRODUCTS, such as fruits, vegetables, etc., now constitute an important portion of ocean borne trade. To land such products at their destination in prime condition, requires that they be held under proper refrigeration in transit. And with indications that this class of cargo will increase, mechanical refrigeration becomes of increasing importance to the Shipping World.

It is of even greater importance that the proper Refrigerating Equipment be installed to start with. Building, as we do, all types of ammonia and CO_2 Refrigerating Machines, we are in position to equip all sizes and types of ships with refrigerating systems for every purpose—from ship stores and drinking water cooling systems to the largest refrigerator ships.

If interested in mechanical refrigeration—and all shipping men are—our extensive facilities and 39 years' experience are at your service.

YORK MANUFACTURING COMPANY

Ice Making and Refrigerating Machinery Exclusively

YORK PENNA.

YORK Engineering, Sales and Service Stations in the Country's Leading Ports

THE CRANDALL ENGINEERING CO.

CONSULTING ENGINEERS CONTRACTING

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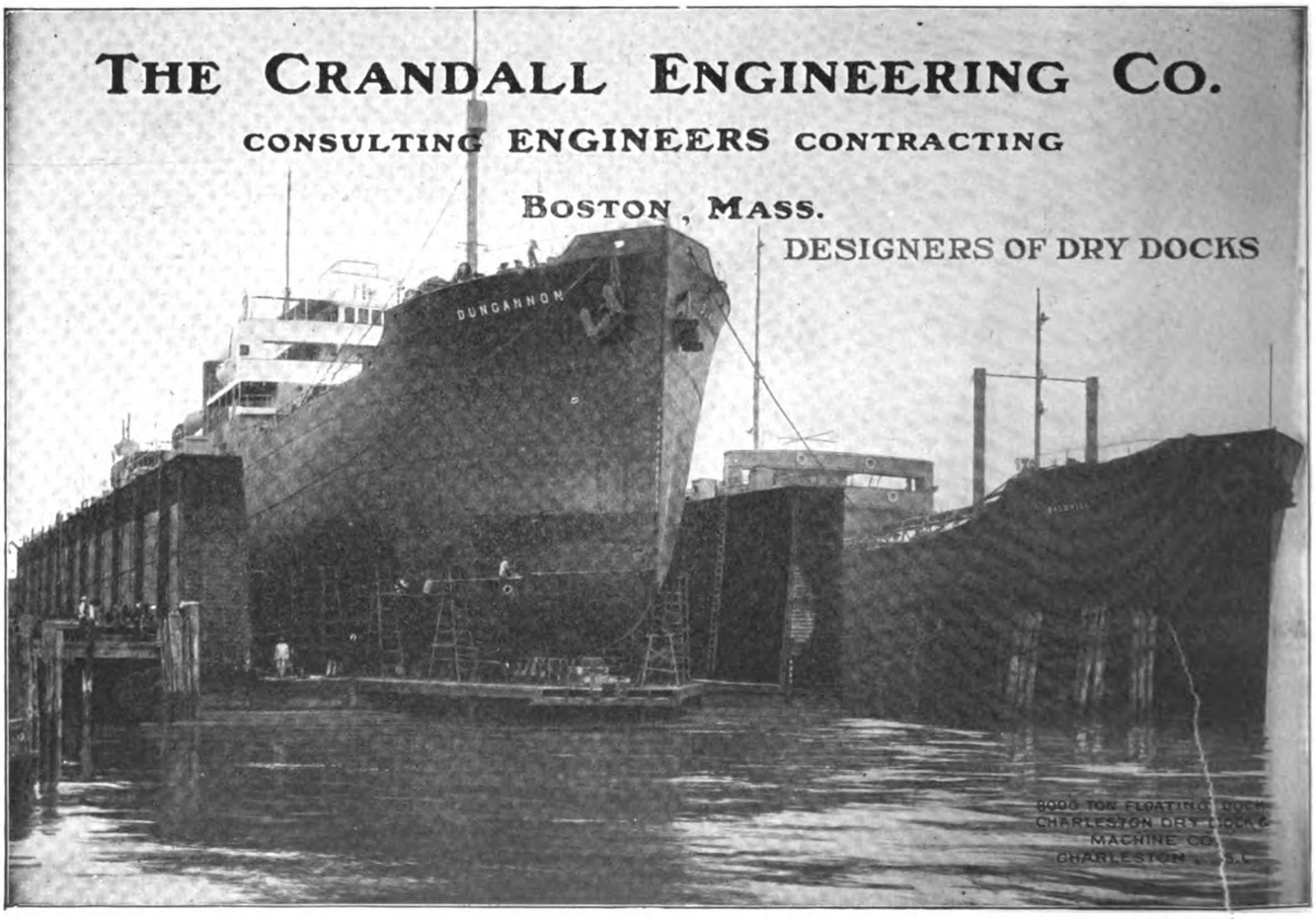
DESIGNERS OF DRY DOCKS



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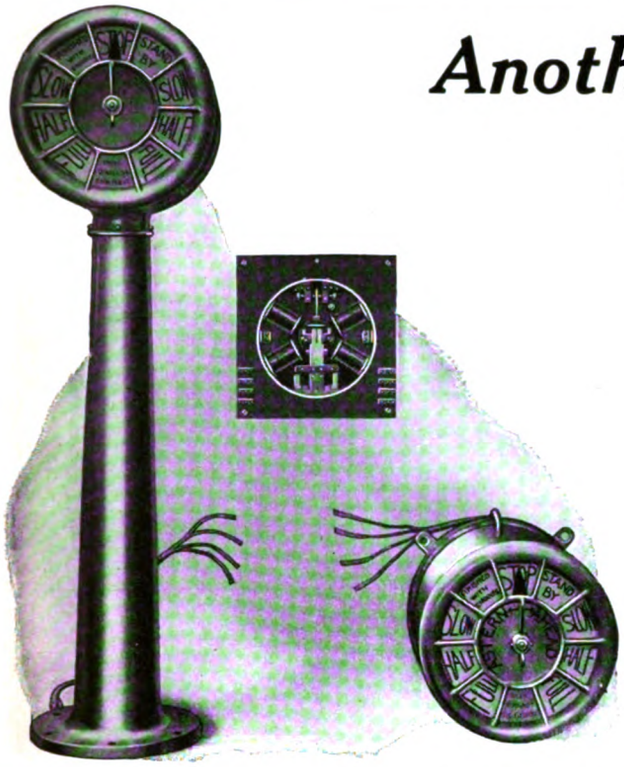

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A dependable telegraph.
No arcing or burned contacts.
Simplified and inexpensive installation.
No worn parts to be renewed.
Only four No. 14 insulated wires to install between bridge and engine room.

Can be seen in operation at our New York Office, No. 8 Reade St.

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SERVICE

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WARREN STEAM PUMP COMPANY

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SAN FRANCISCO—WESTERN ENGINEERING CO.

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In order to pass the rigid requirement of the U. S. Navy, pumps must be built accurately and operate without a hitch.

Our pumps are in use in connection with evaporators on the U. S. naval vessels:

Colorado	**Texas**	**Nevada**
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Pennsylvania	**Idaho**	**Florida**
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Dobbin	**Oklahoma**	**Raleigh**
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We make pumps of all kinds for every sort of service.

Let us quote on your needs.

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Cleco

PRESSURE-SEATED AIR VALVES

THE VALVE THAT NEVER LEAKS

Cleco Valves improve with use; they do not require any attention after installation.

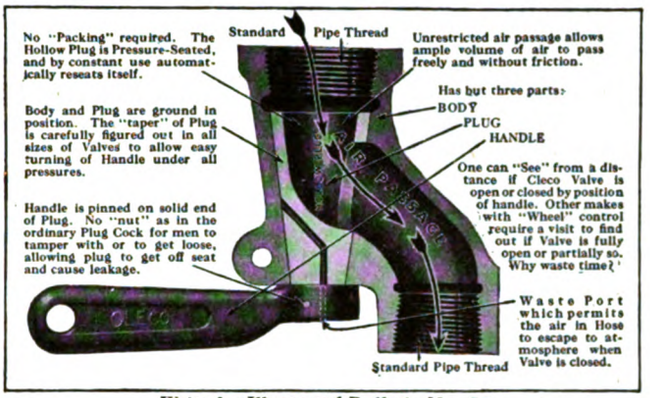
Cleco Valves are made in sizes to suit all requirements from ¼-in. to 2-in. outlets.

Cleco Valves fill all requirements between Air Compressor and Air Tools.

Style SL

Style FW

Style A


No "Packing" required. The Hollow Plug is Pressure-Seated, and by constant use automatically reseats itself.
Body and Plug are ground in position. The "taper" of Plug is carefully figured out in all sizes of Valves to allow easy turning of Handle under all pressures.
Handle is pinned on solid end of Plug. No "nut" as in the ordinary Plug Cock for men to tamper with or to get loose, allowing plug to get off seat and cause leakage.
Standard Pipe Thread
Standard Pipe Thread
Unrestricted air passage allows ample volume of air to pass freely and without friction.
Has but three parts:
BODY
PLUG
HANDLE
One can "See" from a distance if Cleco Valve is open or closed by position of handle. Other makes with "Wheel" control require a visit to find out if Valve is fully open or partially so. Why waste time?
Waste Port which permits the air in Hose to escape to atmosphere when Valve is closed.

Write for Illustrated Bulletin No. 52

Style LW

Style FWL

There is a Cleco Valve made for every need on Air Systems, from Compressor to the Air Tool and for Hose Lines.

Style PO

Multiple Outlet Valves are made in all sizes for Machines having Double-Acting Pistons and for Foundry Molding Machines.

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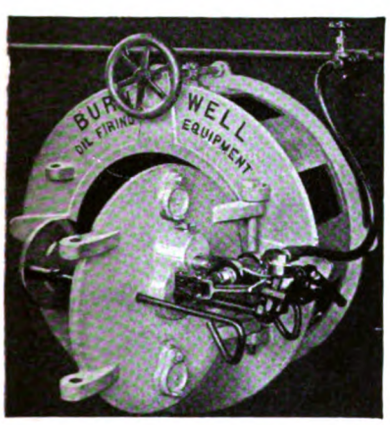
New York Boston St. Louis Chicago Philadelphia Pittsburgh San Francisco Detroit Birmingham

CLEVELAND PNEUMATIC TOOL CO. of Canada, Limited 84 Chestnut St., Toronto Ont. 337 Craig St., W. Montreal, Que.



Note the simplicity and rugged construction of the BURNWELL unit. Extremely fine atomization, a steady flow of oil, Ease of air control, Complete Visibility of fires—are a few features of the Burnwell System.

Isn't this Equitable?

OIL BURNING BURNWELL SYSTEM

If you will send for one of our SHIP DATA SHEETS,—fill out same and return to us, we will advise whether we could GUARANTEE you a SAVING IN FUEL, by installing the BURNWELL SYSTEM on the ship in question. Such procedure, would place you under no obligation to us.

Frankly, we believe that the BURNWELL SYSTEM IS THE MOST ECONOMICAL OIL FIRING SYSTEM IN EXISTENCE. This opinion is shared also by a number of vessel owners and Engineers who have either used or investigated the BURNWELL SYSTEM.

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Send for ship data sheet and illustrated bulletin.

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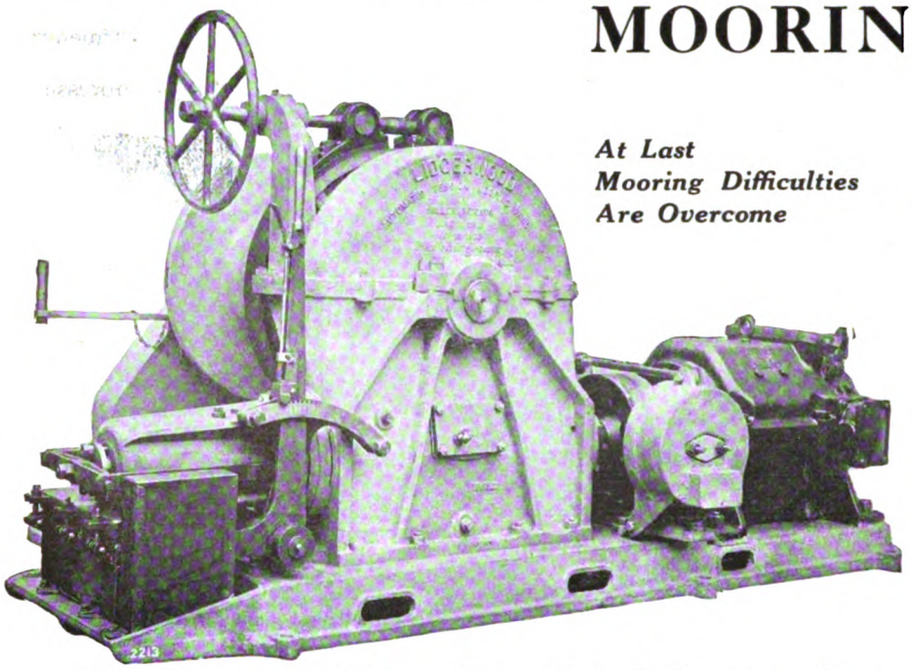
LIDGERWOOD AUTOMATIC MOORING WINCH



At Last Mooring Difficulties Are Overcome

At the end of her most successful trial trip the HENRY FORD II slowly drew up to the dock at Lorain. Four mooring lines passed to the dock and made fast to bollards. *Lidgerwood Automatic Tension Electric Mooring Winches* put in operation, ship laid alongside in less than one minute. The ship still carried a slight headway. Each pair of winches, one paying out and the other winding in, easily checked headway and brought her to rest.

About fifty guests watched each pair of winches. Marine guests expressed operation as wonderful, better than hand-work.

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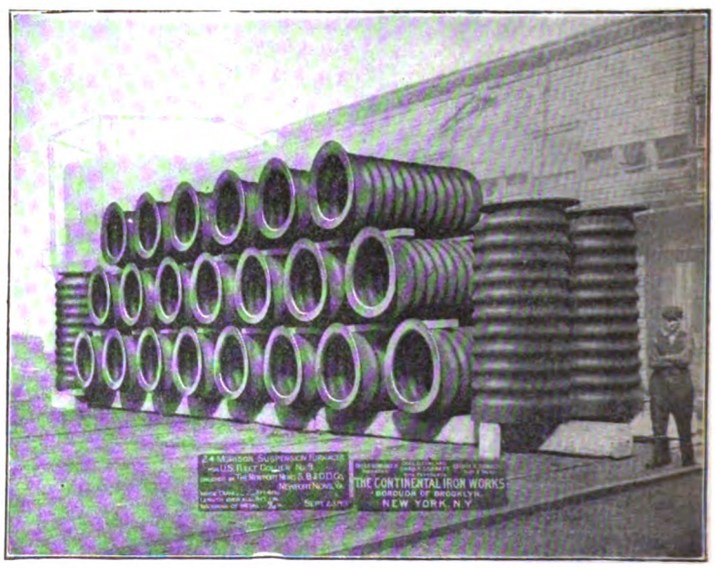
MORISON SUSPENSION FURNACES

For

LAND and MARINE BOILERS



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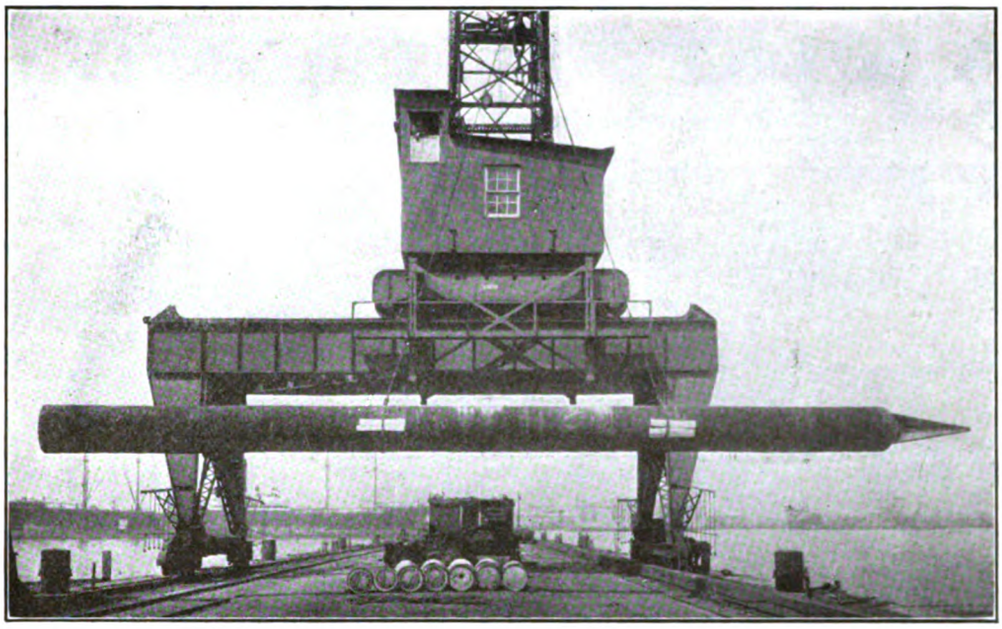

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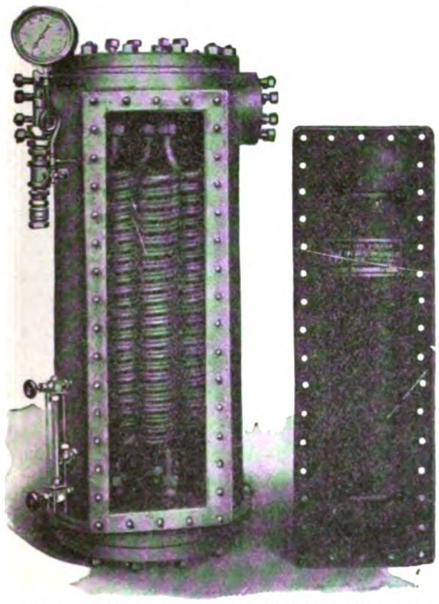
Increase Your Boiler Capacity



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Company .....

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2124 West Street Building, New York.
Please send me free of charge copy of Bulletin 511 describing the Reilly Water Heater.

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MAXIM SILENCER

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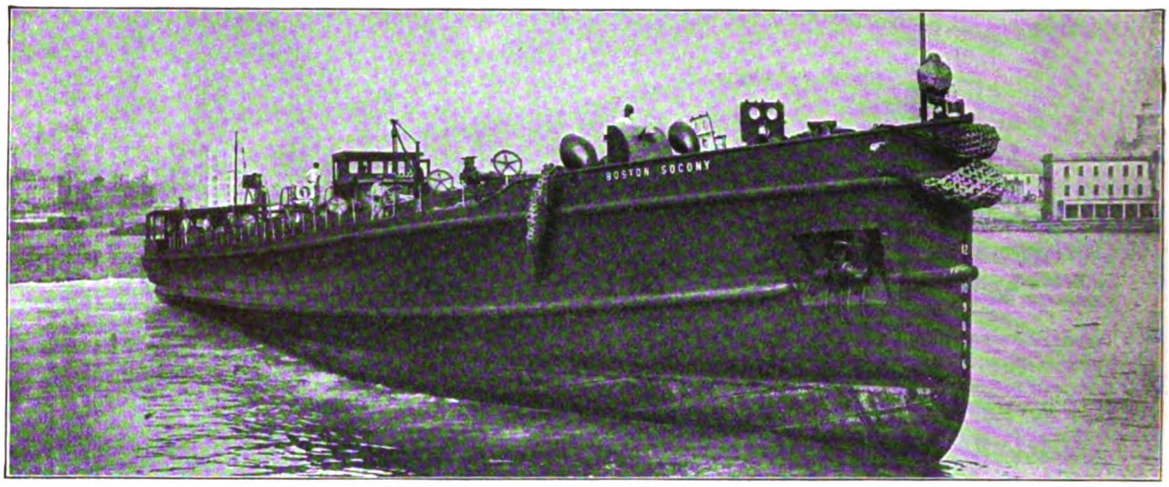

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Electric Arc Welding

By E. Wanamaker and H. R. Pennington

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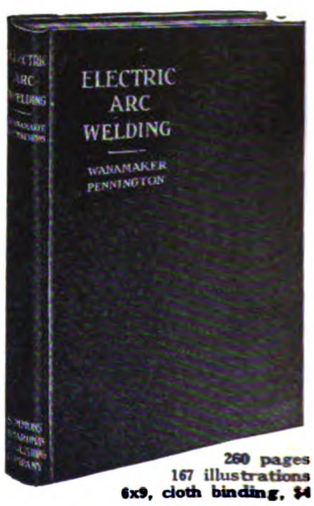
If you do not yet employ the new method, you will find "Electric Arc Welding" extremely interesting in its clear presentation of the *possibilities* of the process.



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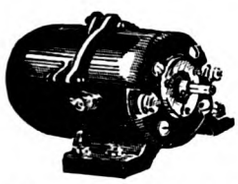
They are accurate, reliable and compact. A complete set consisting of an Ammeter, Voltmeter, Wattmeter and Current Transformer can be carried in an average sized suitcase. All the dependableness that is characteristic of the Weston instrument is built into them. The Weston prestige acquired over a third of a century guarantees their performance.

Our new book, "Electrical Savings in Industry," has been specially prepared for you. Write for it. Also for Bulletin 2006.

WESTON

Electric Speed Indicator



Here is an absolutely dependable, highly accurate speed indicator that can be relied upon to denote shaft revolutions (or speed) and transmit the information to any desired location of the vessel. Model 44 is easy to install, only requires slight lubrication about once a year and gives dependable service incessantly.

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World's Largest Plate Mill!

STEEL plates play an important part in the designing of better marine boilers. Size is a determining factor in selection. To—

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is to secure the largest steel plates made. One plate can be used instead of two, often eliminating dangerous seams—greatly reducing the number of rivets—cutting both construction and maintenance costs, and removing the greatest possibility of boiler failure.

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Lukens Steel Company
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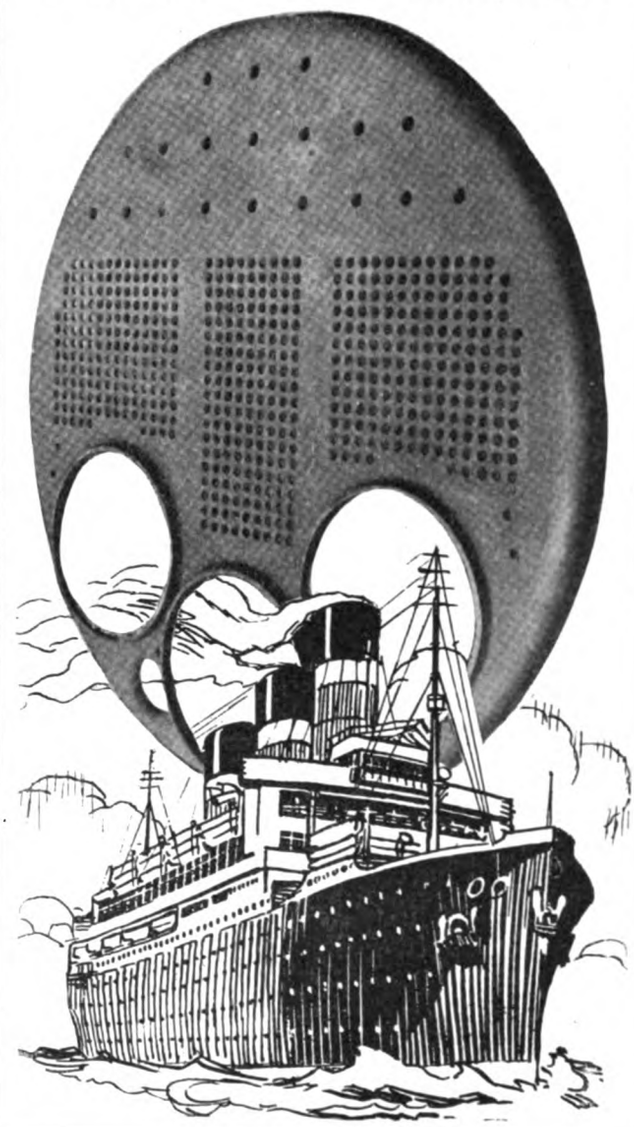

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2. Sectional base type, individual control or solid base, with single supply and return connection.
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The practical design of these Valves provides for DURABILITY, a factor of the greatest importance in devices subjected to such severe service as that of Blow-off Valves.

Automatic cleansing of the seating surfaces, wear resisting materials and renewability of all parts, insure service and economy.

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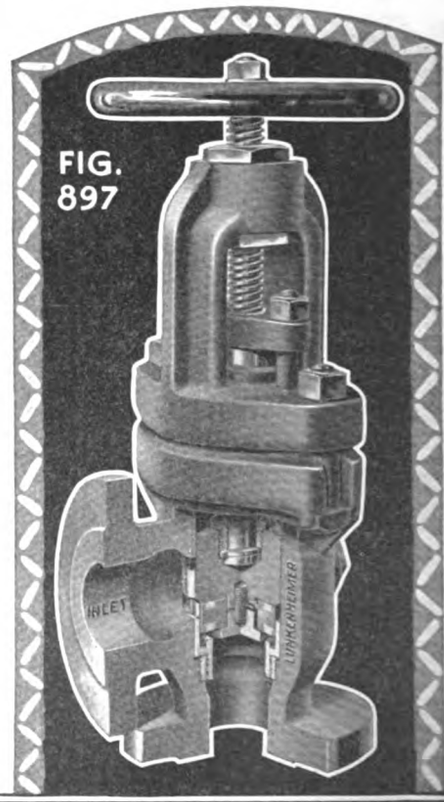

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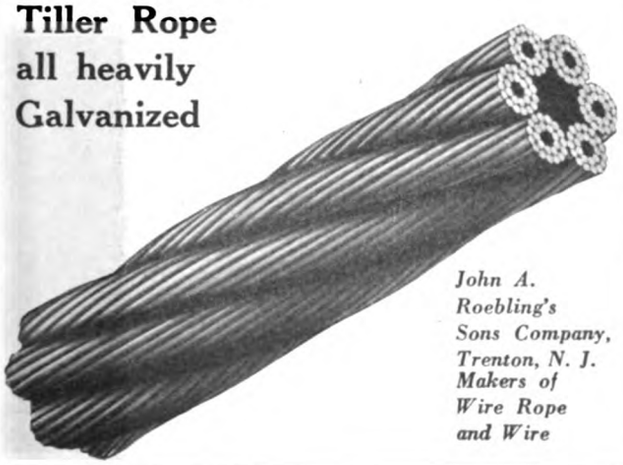
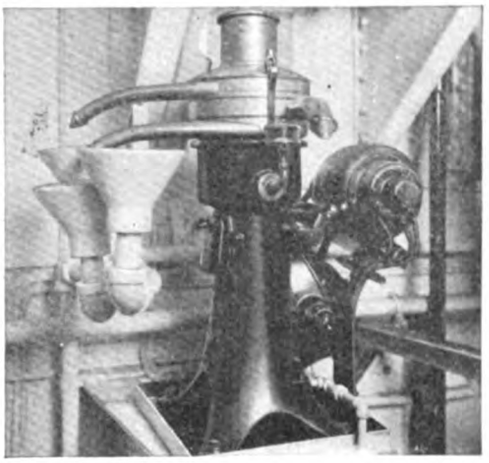


John A. Roebling's Sons Company, Trenton, N. J. Makers of Wire Rope and Wire

De Laval Oil Purifier

on the S. S. President Roosevelt



The De Laval Oil Purifier shown above is maintaining the efficiency of lubricating oil on board the "President Roosevelt" of the United States Lines.

By constantly centrifuging water and sludge out of the oil, the De Laval makes it unnecessary to take oil out of the system. New lubricants are purchased only as required to make up for losses by decomposition, evaporation or leakage.

Centrifugal purification is more positive at all times and especially so while at sea, as the work of the Purifier is not affected by the motion of the ship.

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The De Laval Separator Company

165 BROADWAY, NEW YORK

De Laval Steam Turbine Co. Trenton, N. J. — De Laval Pacific Co. San Francisco

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Please send Bulletin containing further information regarding the De Laval Oil Purifier, as checked below:

☐ **Purification of turbine lubricating oil**

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Company ....M E. 0419

Address .....

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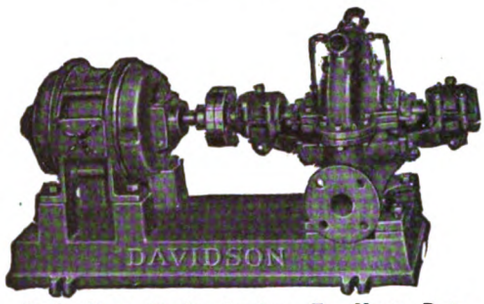

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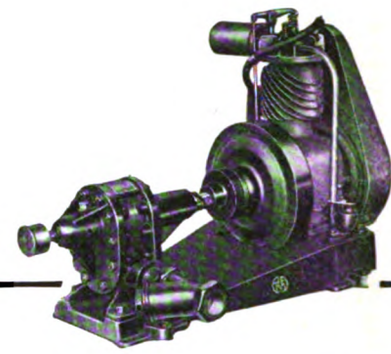

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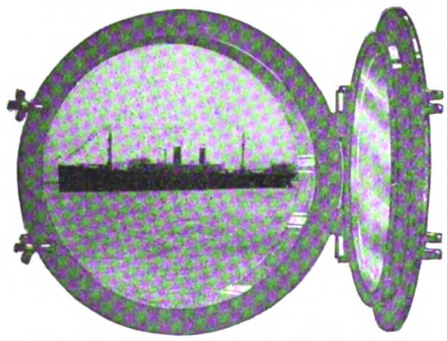

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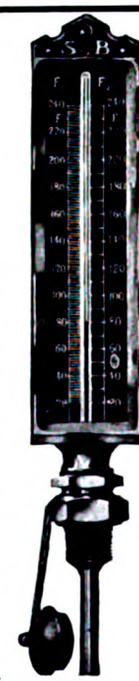

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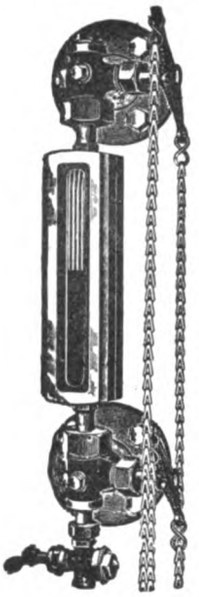

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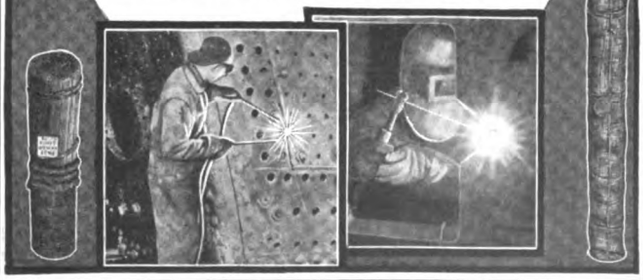

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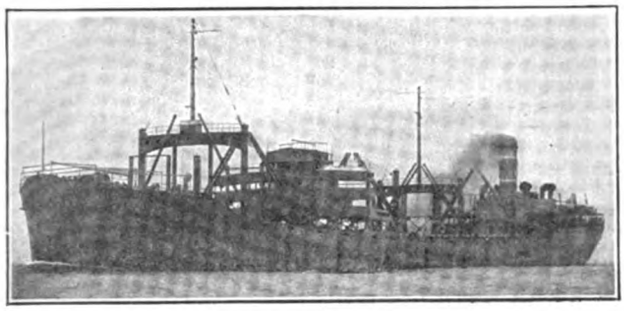

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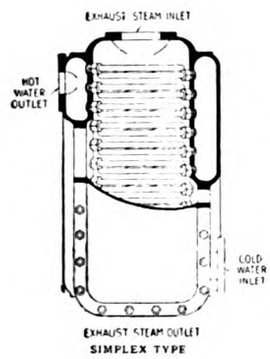

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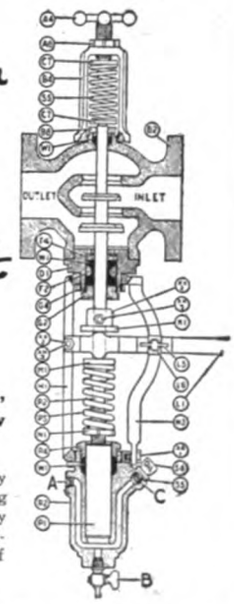

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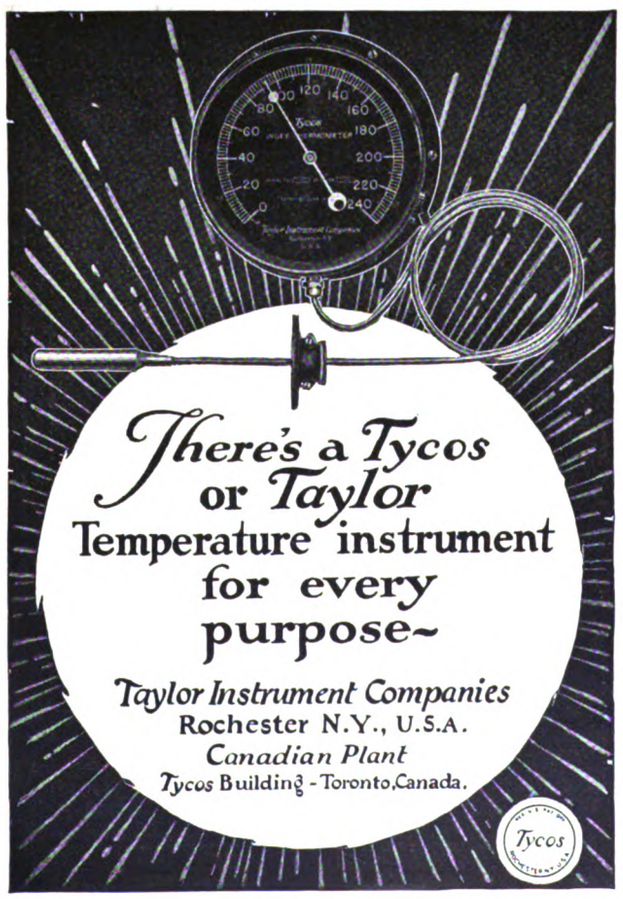
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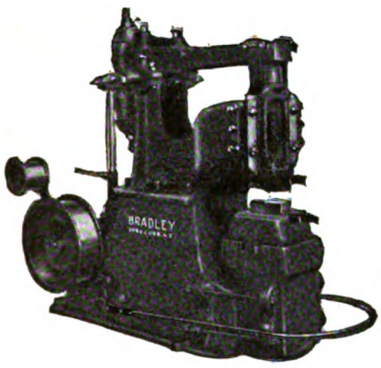

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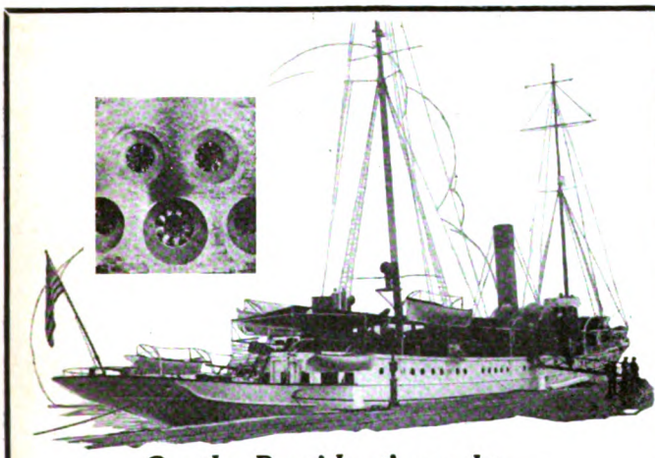

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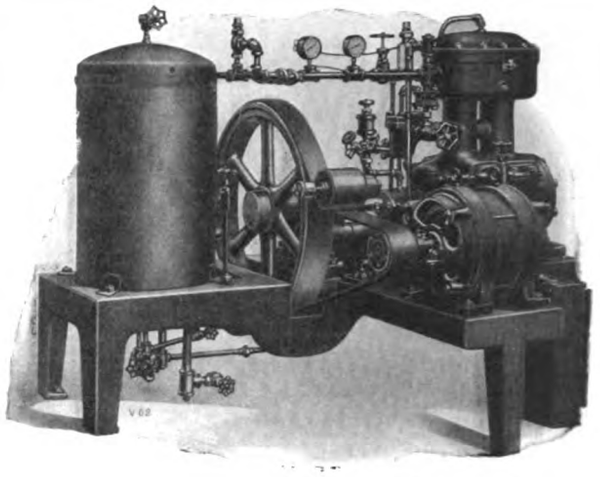

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Combined Refrigerating Machine

Quiet Operation

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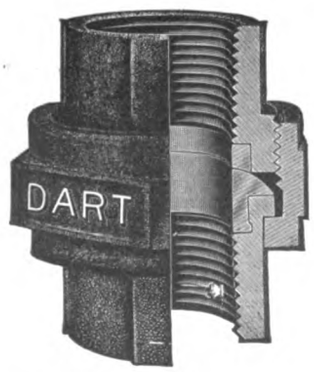

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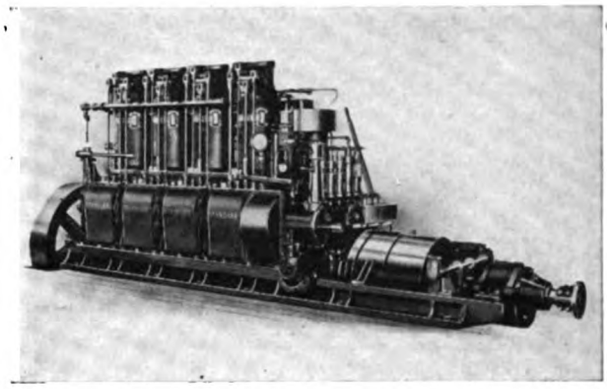
Standard Marine Oil Engines



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Full Diesel, airless fuel injection, low pressure air starting and reversing. Maximum operative simplicity and fuel economy.

Built in sizes from 60 to 300 H.P.

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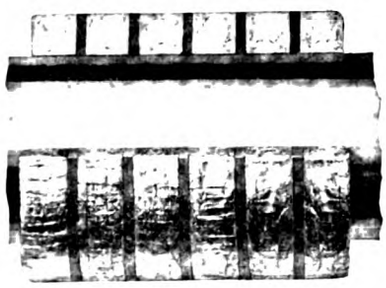

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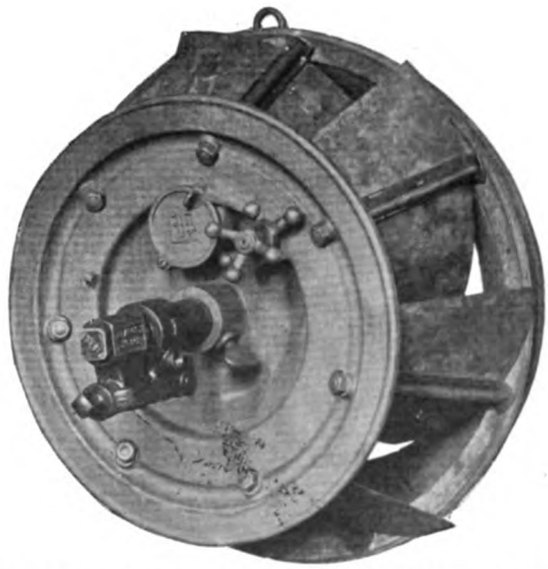

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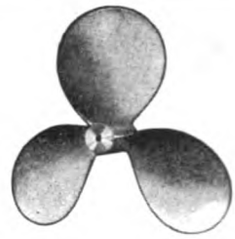

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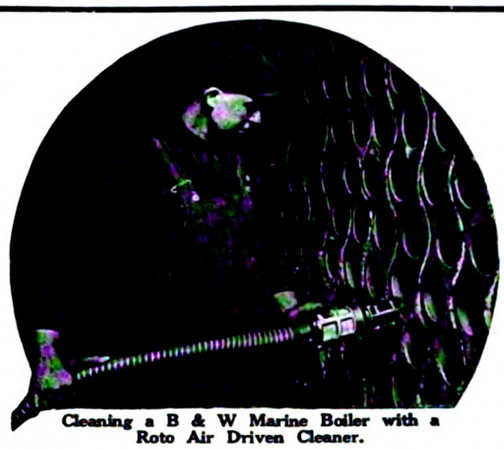

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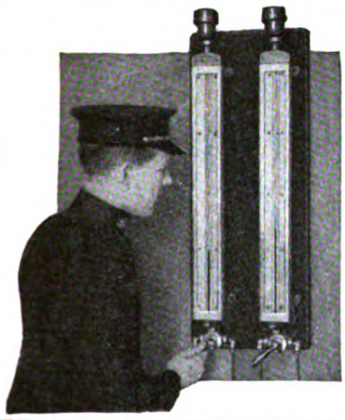

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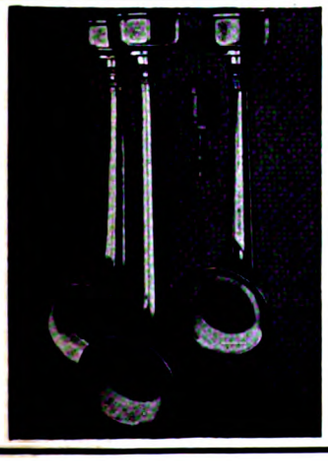

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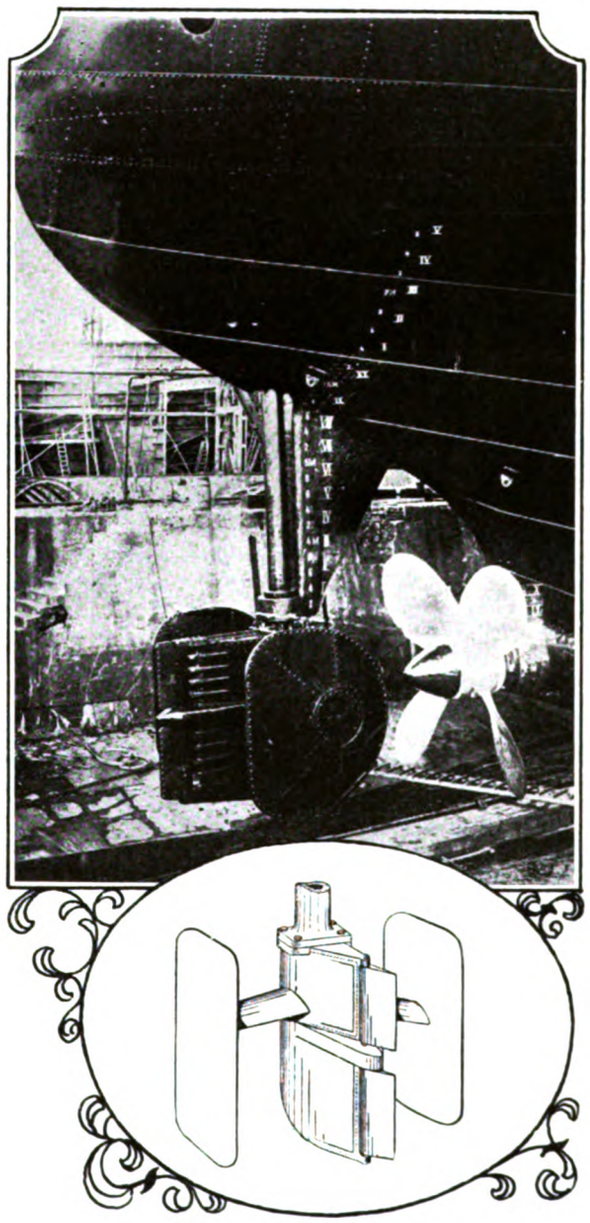

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Compositions
(See Ship's Compositions)

Compression Riveters
(See Pneumatic Riveters)

Condensers
American Engineering Co.
Capstaff-Hunter Turbine Works, Inc.
Davidson Co., M. T.
Davis Engineering Corp.
Griscom-Russell Co.
Ingersoll-Rand Co.
Kearfott Engineering Co.
Warren Steam Pump Co.
Westinghouse Electric & Mfg. Co.
Wheeler Mfg. Co., C. H.
Worthington Pump & Machinery Corp.

Condenser Tubes
American Brass Co.
Chase Metal Works
Kearfott Engineering Co.
Scovill Mfg. Co.

Consulting Engineers
(See Engineers, Consulting)

Conveying Machinery
Lidgerwood Mfg. Co.

Conveyors, Coal
(See Conveying Machinery)

Coolers—Oil Coppers
(See Oil Coolers)

Copper
(See Brass and Copper)

Copper Tubes, Rods, Wires
Chase Metal Works
Scovill Mfg. Co.

Cordage
(Also see Rope and Wire Rope; also Twine)
Columbian Rope Co.
Griscom-Russell Co.
Plymouth Cordage Co.

Corrugated Furnaces
Continental Iron Works, The

Couplings
(See Hose Couplings)

Couplings, Flexible
Falk Corp., The

Coverings, Composition Floor
Marine Decking & Supply Co.

Cranes
American Engineering Co.

Curtains and Fixtures
Pantasote Co., The

Cutting and Welding
(See Welding)

Cylinder Relief Valves
(See Valves)

Cylinder Oil
Vacuum Oil Co.

Cylinders for Compressed Air, Gas, Etc.
Continental Iron Works, The
National Tube Co.

Decking
Briggs Bituminous Composition Co.
Keystone Solether Co.
Lidgerwood Mfg. Co.
Marine Decking & Supply Co.
Penna. Flooring & Woodoleum Co.

Derricks
Lidgerwood Mfg. Co.

Derrick Irons
Lidgerwood Mfg. Co.

Detectors, Elec. Salinity
Babcock & Wilcox Co., The

Diaphragm Pumps
Hyde Windlass Co.

Diesel Engines
(Also see Engines, Oil)
Bessemer Gas Engine Co., The
Bethlehem Shipbuilding Corp.
Busch-Sulzer Bros.-Diesel Engine Co.
Cramp & Sons S. & E. Building Co., The Wm.
Fairbanks, Morse & Co.
Falk Corp., The
Hooven, Owens, Rentschler Co., The
Ingersoll-Rand Co.
Kearfott Engineering Co.
Lombard-Governor Co., The
McIntosh & Seymour Corp.
New London Ship & Engine Co.

Diesel Engines (Continued)
New York Shipbuilding Corp.
Standard Motor Construction Co.
Winton Engine Works
Worthington Pump & Machinery Corp.

Direct-Connected Sets
(See Electrical Plants)

Distillers
(See Evaporators)

Doors, Exterior and Interior
Haskelite Mfg. Co.

Dredging Machinery
American Engineering Co.
Lidgerwood Mfg. Co.
Westinghouse Elec. & Mfg Co.

Dredging Pumps
Worthington Pump & Machinery Corp.

Drills, Electric
(See Electric Drills)

Drills, Pneumatic
(See Pneumatic Tools)

Drills, Portable
(See Portable Drills)

Dry Dock Pumps
Worthington Pump & Machinery Corp.

Dry Docks
(Manufacturer and Marine Railways)
Bethlehem Shipbldg. Corp.
Cramp & Sons S. & E. Building Co., The Wm.
Crandall Engineering Co.
Donnelly, Wm. T.
Federal Shipbuilding and Dry Dock Co.

Dry Docks and Marine Railways
Bethlehem Shipbuilding Corp., Ltd.,
Charleston Dry Dock & Machine Co.
Federal Shipbuilding and Dry Dock Co.
Morse Dry Dock & Repair Co.
Staten Island Shipbuilding Co.
Sun Shipbuilding & Dry Dock Co.
Todd Shipyards Corp.

Dynamometers
Wheeler Mfg. Co., C. H.

Dynamos
(See Electric Plants)

Economizer, Fuel
Griscom-Russell Co.
Power Specialty Co.
Sturtevant Co., The B. F.

Electric Cutouts
General Electric Co.

Electric Cranes
(See Electric Hoists)

Electric Drills
Buffalo Forge Co.

Electric Drills and Grinders
General Electric Co.

Electric Driven Pumps
Ingersoll-Rand Co.

Electric Freight Trucks
(See Freight-Handling Equipment)

Electric Heaters
Cory & Son, Inc., Chas.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Electric Lighting
Cory & Son, Inc., Chas.
Engberg's Electric & Mechanical Works
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Electric Plants
Cory & Son, Inc., Chas.
Engberg's Electric & Mechanical Works
Fairbanks, Morse Co.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Electric Pumps
(See Electric Driven Pumps)

Electric Welding
(See Welding, Electric)

Electrical Instruments
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Engine Generating Sets
Engberg's Electric & Mechanical Works
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Engine
(See Lubricants)

Engine Packing
(See Packing)

Engine Room Counters
(See Revolution Counters)

Engineers, Consulting—Marine
American Engineering Co.
Chapman & Fisher
Cox & Stevens
Crandall Engineering Co.
Davis Engineering Corp.
Donnelly Dry Dock Co.
Ferris, Theodore
Griffin & Cathcart
Martin & Son, Frank S.
Matthews, John B.
Morrell, Rob't W.
Rossell & Thayer
Sharp, Geo. G.
Stein, Wm. Morrison
Teale, Edward O.
Watts, J. Murray
Whittlesey & Whittlesey

Engines for Auxiliaries
De Laval Steam Turbine Co.
Engberg's Electric & Mechanical Works
Fairbanks, Morse & Co.
Hyde Windlass Co.
Kearfott Engineering Co.
McIntosh & Seymour Corp.
Westinghouse Electric & Mfg. Co.

Engines, Gasoline
(See Gasoline Engines)

Engines, Hoisting
(See Hoisting Engines)

Engines, Kerosene
(See Kerosene Engines)

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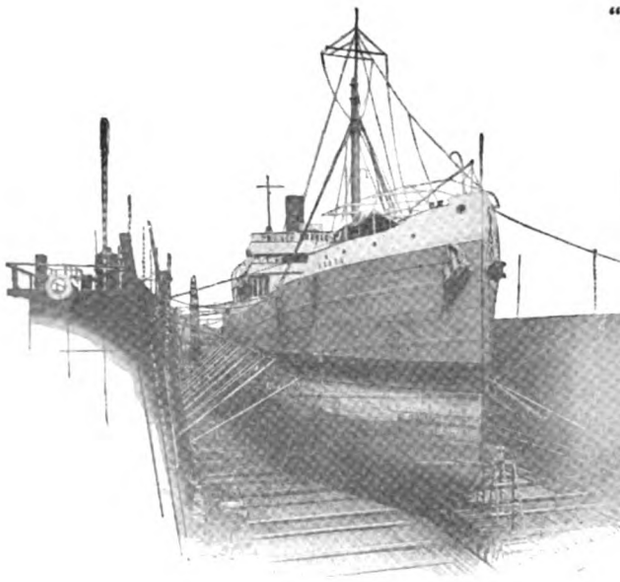
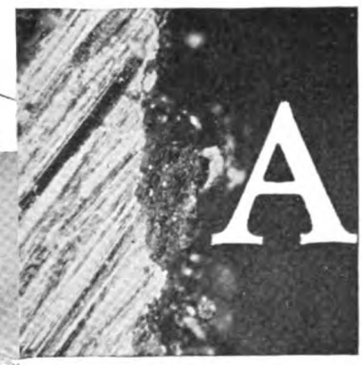
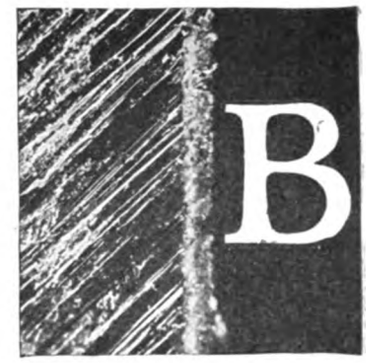


"A"—an unretouched photomicrograph showing what rust does to an unprotected metal surface. The diagonal lines are file marks made in preparing the specimen section for the microscope.



"B"—an unretouched photomicrograph of a metal surface protected by the standard 3-coat covering of red-lead. Note the perfect condition. Rust has not formed.



Keeping your ship's plates like "B"

"DRYDOCKED for scraping and painting of the hull," reads the shipping report. The owners of that ship are taking precautions to see that her plates will not be like the "A" plate.

This repainting of a ship's hull is only one chapter in the constant struggle to protect its steel against rust. Fresh and salt water, and exposure to varying atmospheric conditions — all aid rust in its attempts to weaken and destroy a ship's metal. Only by seeing that your metal is thoroughly protected with paint—with red-lead paint—will you keep that metal strong, reduce depreciation, and prevent future repairs that may be very costly.

Vital spots need paint especially

A bulkhead may never have to help save one of your vessels from Davy Jones's locker. But the strength of its vital metal must be preserved against the day when it may be needed. It is just such vital parts of a ship that need constant red-lead protection against rust. The same protection should be given not only to hulls and bulkheads, but also to cargo holds and coal bunkers.

Save the surface and you save all

Dutch Boy red-lead is an ideal ship paint. It is pure red-lead and makes paint that dries to a hard, tough layer. It gives positive protection against air and moisture, salt and fresh water.

Dutch Boy red-lead tested

Dutch Boy red-lead has been tested, used, and its value as a protector of ship's metal proved. It is used on vessels of the United States Navy and on the smallest craft.

Dutch Boy red-lead comes in both paste form for mixing with linseed oil and as a liquid for immediate application. Both forms come in the natural orange-red color usually used next to the metal. The liquid also comes already tinted to black, browns, and greens for finishing coats. The paste can be shaded to any desired color.

NATIONAL LEAD COMPANY

New York, 111 Broadway; Boston, 131 State St.; Buffalo, 116 Oak Street; Chicago, 900 West 18th St.; Cincinnati, 659 Freeman Ave.; Cleveland, 820 West Superior Avenue; St. Louis, 722 Chestnut St.; San Francisco, 485 California Street; Pittsburgh, National Lead & Oil Co. of Penna., 316 Fourth Avenue; Philadelphia, John T. Lewis & Bros. Co., 437 Chestnut Street.

Dutch Boy Red-Lead

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Engines, Oil
(Also see Diesel Engines)
Bessemer Gas Engine Co., The
Bethlehem Shipbuilding Corp.
Busch-Sulzer Bros. Diesel Engine Co., W.
Cramp & Sons S. & E. Bldg. Co., Wm.
Fairbanks, Morse & Co.
Hooven, Owen, Rentschler Co., The.
Ingersoll-Rand Co.
Kearfott Engineering Co.
Lombard-Governor Co., The
McIntosh & Seymour Corp.
New London Ship & Engine Co.
New York Shipbuilding Corp.
Standard Motor Construction Co.
Winton Engine Co.
Worthington Pump & Machinery Corp.

Engines, Propelling
Bethlehem Shipbuilding Corp.
Busch-Sulzer Bros.-Diesel Engine Co.
Fairbanks, Morse & Co.
Ingersoll-Rand Co.
Kearfott Engineering Co.
McIntosh & Seymour Corp.
Standard Motor Construction Co.
Staten Island Shipbuilding Co.
Winton Engine Co.
Worthington Pump & Machinery Corp.

Engines, Pumping
Davidson Co., M. T.
Davis Engineering Corp.
Fairbanks, Morse & Co.
Griscom-Russell Co.
Ingersoll-Rand Co.
Kearfott Engineering Co.
Worthington Pump & Machinery Corp.

Engines, Steam.
Cramp & Sons S. & E. Building Co., The Wm.
Ingersoll-Rand Co.

Engines, Vertical Steam
Engberg's Electric & Mechanical Works

Engine-Room Supplies
(See Steam Specialties)

Evaporators
American Engineering Co.
Davis Engineering Corp.
Davidson Co., M. T.
Griscom-Russell Co.
Kearfott Engineering Co.

Expansion Joints
Crane Co., The
Griscom-Russell Co.
Lunkenheimer Co., The
Powell Co., The William

Fans, Bracket
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Fans, Exhaust
Buffalo Forge Co.
Diehl Mfg. Co.
Westinghouse Elec. & Mfg. Co.

Files, Slotting-Commutator
Martindale Electric Co.

Feed Water Heaters
Davis Engineering Corp.
Griscom-Russell Co.
Kearfott Engineering Co.
Worthington Pump & Machinery Corp.

Feed Water Regulators
Jerguson Gage & Valve Co.
Kearfott Engineering Co.

Filters, Feed Water
Griscom-Russell Co.

Filters—Marine Oil
Davis Engineering Corp.
Griscom-Russell Co.
Kearfott Engineering Co.

Fire Alarm Systems
Cory & Son, Inc., Chas.

Fire Bricks
Jointless Fire Brick Co.

Fire Clay
Jointless Fire Brick Co.

Fire Extinguishing Systems
Cory & Son, Inc., Chas.

Fire Hose
(See Hose)

Fire Protection Systems
Cory & Son, Inc., Chas.

Fittings, Boiler Room
Crane Co., The
Davis Engineering Corp.
Jerguson Gage & Valve Co.
Kearfott Engineering Co.
Lunkenheimer Co., The
Powell Co., The William

Fittings, Brass
American Brass Co.
Chase Metal Works
Crane Company, The
Lunkenheimer Co., The
Powell Co., The William
Scovill Mfg. Co.
Tiebout, W. & J.

Fittings, Cast Steel
Reading Steel Casting Co., Inc.

Fittings, Hydraulic
Crane Co., The
Lunkenheimer Co., The
Powell Co., The William
Reading Steel Casting Co., Inc.

Fittings, Steel
Reading Steel Casting Co., Inc.

Flanges
Crane Co., The
Lunkenheimer Co., The
Reading Steel Casting Co., Inc.

Flanges, Companion
Crane Co., The
Lunkenheimer Co., The
Powell Co., The William
Reading Steel Casting Co., Inc.

Floating Dry Docks
(See Dry Docks)

Flooring
Briggs Bituminous Composition Co.
Keystone Solether Corp.
Marine Decking & Supply Co.
Penna. Flooring & Woodoleum Co.

Floor Plates
Crane Co., The

Flue Cleaners
(See Boiler Flue Cleaners)

Flux
Air Reduction Sales Co.

Fog Horns
Cory & Son, Inc., Chas.

Forced Draft
(See also Blowers)
De Laval Steam Turbine Co.
General Electric Co.
Kearfott Engineering Co.
Sturtevant Co., B. F.
Westinghouse Elec. & Mfg. Co.

Forges
Bradley & Son, C. C.
Buffalo Forge Co.

Forgings, Bronze
Hyde Windlass Co.

Forgings, Iron and Steel
Capstaff-Hunter Turbine Works, Inc.
Charleston Dry Dock & Machine Co.

Forgings, Monel Metal and Nickel
International Nickel Co.

Forgings, Upset
American Forge Co.

Freight-Handling Equipment
General Electric Co.
Lidgerwood Mfg. Co.
Westinghouse Elec. & Mfg. Co.

Fuel Oil Burners
Babcock & Wilcox Co.
Bethlehem Shipbuilding Corp., Ltd.
Coen Co., Inc.
Morse Dry Dock & Repair Co.
Patten Eng. Co., Inc., John S.
Peabody Engineering Corp.
Todd Oil Burning & Equipment Corp.

Fuel Oil Heaters
Griscom-Russell Co.
Patten Eng. Co., Inc., John S.

Furnace Bridge Walls
Kearfott Engineering Co.

Furnace Construction
Jointless Fire Brick Co.

Furnace Fronts
Continental Iron Works, The

Furnace Linings
Jointless Fire Brick Co.

Furnaces, Corrugated
Continental Iron Works, The

Fusible Plugs
Crane Co., The
Griscom-Russell Co.
Lunkenheimer Co., The

Gage Cocks
Jerguson Gage & Valve Co.
Lunkenheimer Co., The
Powell Co., The William

Gage Glasses
Crane Co., The
Jerguson Gage & Valve Co.
Lunkenheimer Co., The
Powell Co., The William

Gages
(See Draft Gages also Tank Gages)

Gages, Draft
American Schaeffer & Budenberg Corp.
Peabody Engineering Corp
Pneumercator Co.

Gages, Oxy-Acetylene Welding
Air Reduction Sales Co.

Gages, Reflex Water
Jerguson Gage & Valve Co

Gages, Steam
American Schaeffer & Budenberg Corp.
American Steel Foundries
Ashton Valve Co., The
Crane Co., The
Lunkenheimer Co., The
Powell Co., The William
Taylor Instrument Co.

Gages, Tank
American Schaeffer & Budenberg Corp.

Gages, Vacuum
American Schaeffer & Budenberg Corp.

Gas Engine Specialties
Crane Co., The
Lunkenheimer Co., The
Powell Co., The William

Gaskets
(Also see Packing)
Crane Co., The
Griscom-Russell Co.
International Nickel Co.

Gasoline Engines
Fairbanks, Morse & Co.
Standard Motor Construction Co.
Winton Engine Co.

Gears
De Laval Steam Turbine Co.
Falk Corp., The
Sturtevant Co., B. F.
Westinghouse Electric & Mfg. Co.

Gears, Hydraulic Speed
Waterbury Tool Co.

Gears, Variable
Waterbury Tool Co.

Gears, Worm Reduction
De Laval Steam Turbine Co.

General Welding and Cutting Equipment
(See Welding and Cutting Apparatus and Supplies)

Generating Sets
Engberg's Electric & Mechanical Works
Fairbanks, Morse & Co.
General Electric Co.
Sturtevant Co., B. F.
Westinghouse Electric & Mfg. Co.
Worthington Pump & Machinery Corp.

Generators, Acetylene
Air Reduction Sales Co.

Generators, Electric
Diehl Mfg. Co.
Engberg's Electric & Mechanical Works
Fairbanks, Morse & Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Gloves, Welding
Air Reduction Sales Co.

Goggles
Air Reduction Sales Co.

Governor Valves
(See Valves, Governor)

Governors
Cory & Son, Inc., Chas.
Lombard-Governor Co., The

Governors, Pump
Atlas Valve Co.

Grate Bars
Kearfott Engineering Co.

Grease Cups
Crane Co., The
Lunkenheimer Co., The
Powell Co., The William

Grease Extractors
American Schaeffer & Budenberg Corp.
Davis Engineering Corp.
Griscom-Russell Co.

Griddles, Electric
Edison Electrical Appliance Co., Inc.

Grinders
Martindale Electric Co.

Grinders—Electric and Pneumatic
Cleveland Pneumatic Tool Co., The
Ingersoll-Rand Co.

Gypseys
American Engineering Co.
Hyde Windlass Co.
Lidgerwood Mfg. Co.

Gyro-Compass
Sperry Gyroscope Co.

Gyro-Pilot
Sperry Gyroscope Co.

Hammers, Power
Bradley & Son, C. C.

Hammers, Pneumatic
(See Pneumatic Tools)

Hardware
(See Marine Hardware)

Hardwood
(See Lumber)

Hawse Pipes
Kearfott Engineering Co.

Hawsers—Manila
(Also see Rope and Wire Rope)
Columbian Rope Co.
Plymouth Cordage Co.

Heaters
(Bath, Lavatory, Shower)
Griscom-Russell Co.
Kearfott Engineering Co.
Sturtevant Co., B. F.

Heaters, F. O.
Coen Co., Inc.
Griscom-Russell Co.

Heating Tables, Electric
Edison Electrical Appliance Co., Inc.

Hemp
(See Twine)

Hoisting Engines
American Engineering Co.
Fairbanks, Morse Co.
Hyde Windlass Co.
Lidgerwood Mfg. Co.

Hoisting and Transmission Rope
(See Rope)

Hoists
Ingersoll-Rand Co.

Hoists, Chain and Block
Marine Decking & Supply Co.

Hoists, Electric
American Engineering Co.
General Electric Co.
Hyde Windlass Co.
Lidgerwood Mfg. Co.
Westinghouse Elec. & Mfg. Co.

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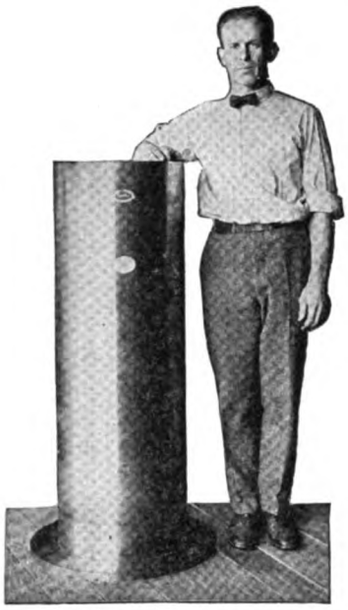
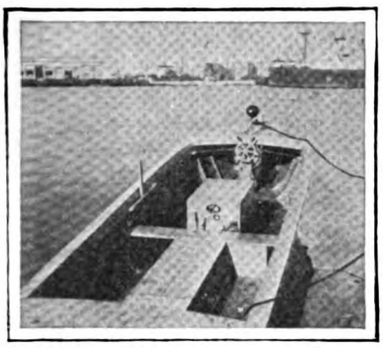


A "Cutless Bearing" for an ocean-going vessel 13-15/32 in. shaft, 16-1/8 in. o.d. 48-1/2 in. over all.



For two years "Cutless Bearings" using water as a lubricant were operated on the muddy Colorado River on the Big Boulder Dam project, without replacing a single bearing.

IMPORTANT—The following reputable agents have "Cutless Bearings" in stock. Others are being rapidly appointed—

BOSTON, Walter H. Moreton Corp. and United Fisheries Company.

GLOUCESTER, MASS., United Fisheries Co.

NEW BEDFORD, MASS., Hathaway Mach. Co.

Setting a New Standard of Bearing Service—

The use of rubber as a bearing surface has enabled Goodrich "Cutless Bearings" to set a new standard of bearing wear.

It permits using water as a lubricant. The tough Olivite rubber surface when wet offers less resistance to friction than a babbitted or other metal surface. Greatly increased bearing life results.

But long life is not the only advantage. The rubber acts as a shock absorber and shaft vibration is greatly reduced.

Sand or grit cannot become imbedded in the rubber walls. Water washes the sand out along a spiral groove or channel which runs along the bearing surface. This practically eliminates shaft scoring.

Goodrich "Cutless Bearings" are proven economies—they are used and recommended by leading ship-owners and naval architects on all types of vessels, from ocean-liners to motor-run-abouts.

THE B. F. GOODRICH RUBBER COMPANY
Akron, Ohio ESTABLISHED 1870

Goodrich

Cutless Bearings

"BEST IN THE LONG RUN"

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Holders-On
Chicago Pneumatic Tool Co.
Ingersoll-Rand Co.

Horizontal Punches
Cleveland Punch & Shear Works Co.

Hose
Air Reduction Sales Co.
Chicago Pneumatic Tool Co.
Cleveland Pneumatic Tool Co., The
Goodrich Rubber Co., The B. F.
Ingersoll-Rand Co.

Hose Coupling
Air Reduction Sales Co.
Chicago Pneumatic Tool Co.
Cleveland Pneumatic Tool Co., The
Ingersoll-Rand Co.

Humidifiers
Griscom-Russell Co.

Hydraulic Fittings
(See Fittings, Hydraulic)

Hydraulic Presses and Other Machinery
Warren Steam Pump Co.

Hydrostats
Atlas Valve Co.

Ice Machines
(See Refrigerating Machinery)

Indicator Connections
Powell Co., The William

Indicators
(Steam and Gas Engine)
American Schaeffer & Budenberg Corp.
Powell Co., The William

Ingots, Monel Metal and Nickel
International Nickel Co.

Injectors
Powell Co., The William

Insulating Beads
Martindale Electric Co.

Interlocking Rubber Tiling
Griscom-Russell Co.

Iron Pipe
(See Pipe)

Jacks—Steamboat Ratchet (Pulling)
Griscom-Russell Co.

Journal Bearings
(See Thrust Bearings)

Jute
Columbian Rope Co.

Kerosene Engines
Fairbanks, Morse & Co.
Standard Motor Construction Co.

Lamps, Signals and Fixtures
Cory & Son, Inc., Chas.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Launches and Yachts
(See Shipbuilders)

Lavatories (Stateroom)
Crane Co., The

Lead, White, Red
National Lead Co.

Lighting Sets
(See Electric Plants)

Lights, Electric
(See Electric Lights)

Lines—Towing, Buoy
(See Rope)

Loading and Unloading Equipment
(See Freight-Handling Equipment)

Locomotive Cranes
(See Cranes)

Lubricants, Oil and Grease
Vacuum Oil Co.

Lubricators
Crane Co.
Griscom-Russell Co.
Lunkenheimer Co.
Powell Co., The William

Lumber
McKenna, Inc., J. F.

Machine Tools
Cleveland Pneumatic Tool Co.

Machinery, Marine
Bethlehem Shipbuilding Corp.

Manganese Bronze Castings
Columbian Bronze Corp.
Cramp & Sons S. & E. Building Co., The Wm.
Griscom-Russell Co.
Hyde Windlass Co.
Powell Co., The William

Manila and Sisal Rope
(See Rope)

Manifolds
Cleveland Pneumatic Tool Co.
Ingersoll-Rand Co.

Marine Cableways
Lidgerwood Mfg. Co.

Marine Coatings
(See Anti-Rust Coatings)

Marine Decking
(See Decking)

Marine Engines
(See Engines, Propelling)

Marine Engineers
(See Engineers, Consulting)

Marine Forgings
(See Forgings)

Marine Glue
Briggs Bituminous Composition Co.

Marine Hardware
Tiebout, W. & J.

Marine Heaters
(See Heaters)

Marine Paint
Briggs Bituminous Composition Co., Inc.
Wailes Dove-Hermiston Corp.

Marine Plumbing
Crane Co., The

Marine Railway Builders
Crandall Engineering Co.

Marine Railways
(See Dry Docks)

Marine Ranges
(See Ranges, Galley)

Marine Refrigeration
(See Refrigerating Machinery)

Marine Repairs
(See Shipbuilders)

Marine Shafting
(See Shafting)

Marine Superheaters
Babcock & Wilcox Co.
Power Specialty Co.
Superheater Co., The

Marine Supplies
Tiebout, W. & J.

Marine Wiring Devices
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Mast Arm Rope
Roebling's Sons Co., J. A.

Masts, Tubular Steel
National Tube Co.

Mechanical Telegraphs
Cory & Son, Inc., Chas.

Metal Protection, Paints
(See Paints, Metal Protection)

Meters, Fuel Oil
National Meter Co.

Meters, Oil
National Meter Co.

Meters, Water
National Meter Co.

Mooring Engines
American Engineering Co.
Hyde Windlass Co.
Lidgerwood Mfg. Co.

Mooring Lines
Roebling's Sons Co., J. A.

Motor Boats
(See Shipbuilders)

Motor Boat Supplies
Tiebout, W. & J.

Motors, Electric
Diehl Mfg. Co.
Engberg's Electric & Mechanical Works
Fairbanks, Morse & Co.
General Electric Co.
Sturtevant Co., B. F.
Westinghouse Elec. & Mfg. Co.

Motors, Gasoline
(See Gasoline Engines)

Mufflers
Maxim Silencer Co., The

Multiwhirl Oil Coolers
Griscom-Russell Co.

Naval Architects
Chapman & Fisher
Cox & Stevens
Donnelly Dry Dock Co.
Ferris, Theodore
Griffin & Cathcart
Martin & Son, Frank S.
Matthews, John B.
Morrell, Robt. W.
Rossell & Thayer
Sharp, Geo. G.
Watts, J. Murray
Whittelsey & Whittelsey

Navigation Instruments
Sperry Gyroscope Co.

Needle Valves
(See Valves)

Nipples
Crane Co., The
Lunkenheimer Co., The

Nitrogen—Gas
Air Reduction Sales Co.
Linde Air Products Co., The

Nozzle, Acetylene
(See Acetylene Nozzle)

Nozzles
(See Hose Nozzles)

Oakum
Stratford Oakum Co., Geo.

Oil Burners, Fuel
(See Fuel Oil Burners)

Oil Burning Equipment
Bethlehem Shipbldg. Corp.
Coen Co., Inc.
Morse Dry Dock & Repair Co.
Patten Eng. Co., Inc., John S.
Peabody Engineering Corp.
Todd Oil Burning & Equipment Corp.

Oil Coolers
Griscom-Russell Co.
Patten Eng. Co., Inc., John S.

Oil, Cylinder
Vacuum Oil Co.

Oil Cups
Crane Co.
Griscom Russell Co.
Lunkenheimer Co., The
Powell Co., The William

Oil Engines
(See Engines, Oil)

Oil Fuel Apparatus
(See Oil-Burning Equipment)

Oil Gages
Crane Co.
Lunkenheimer Co., The
Powell Co., The William

Oil Heaters and Coolers
Davis Engineering Corp.
Griscom Russell Co.
Patten Eng. Co., Inc., John S.

Oil, Linseed
National Lead Co.

Oil, Lubricating
Vacuum Oil Co.

Oil Purifiers
(See Purifiers, Oil)

Oil Strainers
Coen Co., Inc.
Patten Eng. Co., Inc., John S.

Oiling Systems
(Also see Lubricators)
Lunkenheimer Co., The
Powell Co., The William

Ore-Handling Machinery
(See Coal-Handling Machinery)

Ovens, Baking—Electric
Edison Electrical Appliance Co., Inc.
Westinghouse Elec. & Mfg. Co.

Ovens, Warming
Edison Electrical Appliance Co., Inc.

Oxy-Acetylene Welding and Cutting
Pest-O-Lite Co., Inc.

Oxygen—Gas
Air Reduction Sales Co.
Linde Air Products Co.

Packing, Asbestos
Crane Co.

Packing, Metallic
Crane Packing Co.

Paint, Metal Protection
Briggs Bituminous Composition Co.
Goldschmidt Corp., Th.
Marine Decking & Supply Co.
National Lead Co.
Wailes Dove-Hermiston Corp.

Panelling
(Marine Fireproof)
Marine Decking & Supply Co.
Penna. Flooring & Woodoleum Co.

Panels, Interior & Exterior
Haskelite Mfg. Co.

Partitions
(Marine Fireproof)
Haskelite Mfg. Co.
Marine Decking & Supply Co

Phosphor Bronze Castings
Columbian Bronze Corp.
Griscom-Russell Co.
Hyde Windlass Co.

Pile Drivers
Lidgerwood Mfg. Co.

Pilot House Control, Electric
Westinghouse Elec. & Mfg. Co.

Pipe
American Brass Co.
Chase Metal Works
National Tube Co.
Scovill Mfg. Co.

Pipe Fittings
Atlas Valve Co.

Pipe Flanges
(See Flanges)

Pipe, Steel
National Tube Co.

Pipe Unions
Atlas Valve Co.
Crane Co.
Lunkenheimer Co., The
Powell Co., The William

Piston Rings
(See Packing)

Planers
(Metal Working)
Cleveland Pneumatic Tool Co.

Plastic Fire Bricks
Jointless Fire Brick Co.

Plates, Boiler, Firebox, Etc.
Lukens Steel Co.

Plugs and Receptacles (Watertight)
Cory & Son, Inc., Chas.

Plumbing
(See Marine Plumbing)

Pneumatic Drills
(See Pneumatic Tools)

Pneumatic Hammers
(See Pneumatic Tools)

Pneumatic Riveters
Ingersoll-Rand Co.

Pneumatic Separators
Griscom-Russell Co.

Pneumatic Tools
Cleveland Pneumatic Tool Co.
Chicago Pneumatic Tool Co.
Ingersoll-Rand Co.

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Zinc You Can Use Yourself

On or near the water a paint is demanded that will successfully resist exposure to fog, rain, wind, sunshine, and extreme changes of temperature.

Under these conditions zinc content paints are necessary for complete protection. If you mix your own paint, you can obtain Zinc Oxide in the form of a paste called

MAPAZ

Mapaz No. 1 is The New Jersey Zinc Company's Green Seal French Process Zinc Oxide ground in refined linseed oil. It reduces chalking, improves the lustre, insures the whiteness of white paints, makes purer the colors of tinted paints, and makes both the color and the paint film last longer.

Mapaz No. 1 is ground according to our formula by the following licensed manufacturers:

Master Painters Supply Co., Inc., 160 Front Street, New York

Peaslee-Gaulbert Co., Incorporated, Louisville, Ky., Atlanta, Ga., Dallas, Texas

U. S. Gutta Percha Paint Co., Providence, R. I.

New Jersey Zinc The New Jersey Zinc Company New Jersey Zinc

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Portable Drills
Buffalo Forge Co.
General Electric Co.

Presses
(See Hydraulic Presses)

Professional Cards
Chapman & Fisher
Edwards, Edward A.
Ferris, Theodore
Griffin & Cathcart
Matthews, John B.
Rossell & Thayer
Sharp, Geo. G.
Watts, J. Murray
Whittelsey & Whittelsey

Projectors
(See Searchlights)

Propeller Shafts
(See Shafting)

Propeller—Contra
Goldschmidt Corp., Th.

Propeller Wheels
Bethlehem Shipbldg. Corp.
Cramp & Sons S. & E. Building Co., The Wm.
Columbian Bronze Corp.
Donnelly, Wm. T.
Hyde Windlass Co.
Kearfott Engineering Co.

Pumping Machinery
(See Engines, Pumping)

Pumps
Bethlehem Shipbldg. Corp.
Buffalo Steam Pump Co.
Coen Co., Inc.
Davidson Co., M. T.
Davis Engineering Corp.
De Laval Steam Turbine Co.
Fairbanks, Morse & Co.
Griscom-Russell Co.
Hyde Windlass Co.
Ingersoll-Rand Co.
Northern Fire Apparatus Co.
Warren Steam Pump Co.
Westinghouse Electric & Mfg. Co.
Wheeler Mfg. Co., C. H.
Worthington Pump & Machinery Corp.

Pumps, Ballast
Buffalo Steam Pump Co.
Davidson Co., M. T.
Fairbanks, Morse & Co.
Ingersoll-Rand Co.
Northern Fire Apparatus Co.
Warren Steam Pump Co.
Worthington Pump & Machinery Corp.

Pumps, Bilge
American Machine & Foundry Co.
Buffalo Steam Pump Co.
Davidson Co., M. T.
De Laval Steam Turbine Co.
Fairbanks, Morse & Co.
Ingersoll-Rand Co.
Northern Fire Apparatus Co.
Warren Steam Pump Co.
Worthington Pump & Machinery Corp.

Pumps, Boiler Feed
Buffalo Steam Pump Co.
Davidson Co., M. T.
De Laval Steam Turbine Co.
Fairbanks, Morse & Co.
Ingersoll-Rand Co.
Northern Fire Apparatus Co.
Warren Steam Pump Co.
Worthington Pump & Machinery Corp.

Pumps, Centrifugal
Buffalo Steam Pump Co.
Fairbanks, Morse & Co.
Ingersoll-Rand Co.
Kearfott Engineering Co.
Westinghouse Elec. & Mfg. Co.
Wheeler Mfg. Co., C. H.
Worthington Pump & Machinery Corp.

Pumps, Circulating
American Machine & Foundry Co.
Fairbanks, Morse & Co.
Ingersoll-Rand Co.

Pumps, Deck
Ingersoll-Rand Co.
Warren Steam Pump Co.

Pumps, Elec. Driven
American Machine & Foundry Co.
Buffalo Steam Pump Co.
Fairbanks, Morse & Co.
General Electric Co.
Ingersoll-Rand Co.
Northern Fire Apparatus Co.
Warren Steam Pump Co.
Westinghouse Elec. & Mfg. Co.
Worthington Pump & Machinery Corp.

Pumps, Fuel Oil
Buffalo Steam Pump Co.
Coen Co., Inc.
Davidson Co., M. T.
Northern Fire Apparatus Co.
Warren Steam Pump Co.

Pumps, Gasoline
American Machine & Foundry Co.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Pumps, Oil
Coen Co., Inc.
Davidson Co., M. T.
Ingersoll-Rand Co.
Lunkenheimer Co., The
Powell Co., The Wm.
Northern Fire Apparatus Co.
Warren Steam Pump Co.
Worthington Pump & Machinery Corp.

Pumps, Rotary
American Machine & Foundry Co.
Buffalo Steam Pump Co.
Northern Fire Apparatus Co.

Pumps, Sanitary
American Machine & Foundry Co.
Davidson Co., M. T.
Northern Fire Apparatus Co.
Warren Steam Pump Co.

Pumps, Variable Delivery
Waterbury Tool Co.

Punching and Shearing Machines
Buffalo Forge Co.

Purifiers, Oil
De Laval Separator Co.
De Laval Steam Turbine
Griscom-Russell Co.
Sharples Specialty Co., The

Pyrometers
Superheater Co., The

Quadrant Davits
(See Davits)

Ranges, Galley
Stamford Foundry Co., The

Ranges, Electric
Westinghouse Elec. & Mfg. Co.

Reamers
Cleveland Pneumatic Tool Co., The
Ingersoll-Rand Co.

Reclaiming Systems for Oil
De Laval Separator Co.
Sharples Specialty Co., The

Reducing Gears
(See Gears)

Reels for Hawsers
Roebling's Sons Co., J. A.

Refractories
Jointless Fire Brick Co.

Refrigerating Machinery
Brunswick-Kroeschell Co.
Frick Co.
Ingersoll-Rand Co.
Westinghouse Electric & Mfg. Co.
York Mfg. Co.

Regulators, Damper
Atlas Valve Co.

Regulators, Oxy-Acetylene
Air Reduction Sales Co.

Regulators, Pressure
American Schaeffer & Budenberg Corp.
Atlas Valve Co.
Crane Co.
Powell Co., The Wm.

Regulators, Temperature
American Schaeffer & Budenberg Corp.

Releasing Gear, Boat
Cramp & Sons Ship & Engine Building Co., The Wm.

Repairs, Marine
Bethlehem Shipbuilding Corp.
Capstaff-Hunter Turbine Works, Inc.
Federal Shipbuilding Co.
Tickle Engineering Works, Arthur
Todd Shipyards Corp.

Revolution Counters
American Schaeffer & Budenberg Corp.
Cory & Son, Inc., Chas.

Rheostats
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Rigging
(See Rope; also Wire Rope)

River Boats
(See Shipbuilders)

Rivet Busters, Rivet Clamps and Rivet Tongs
Cleveland Pneumatic Tool Co., The
Ingersoll-Rand Co.

Riveters
(See Pneumatic Tools)

Rods, Brass
Bridgeport Brass Co.
Chase Metal Works
Page Steel & Wire Co.
Scovill Mfg. Co.

Rods, Monel Metal and Nickel
International Nickel Co.

Rods, Welding
(See Welding Rods)

Rope
(Also see Wire Rope)
Columbian Rope Co.
Plymouth Cordage Co.
Roebling's Sons Co., J. A.

Rope Transmission
Columbian Rope Co.

Rotary Blowers
(See Blowers)

Rubber Tiling
(See Interlocking Rubber Tiling)

Rudders, Flettner
Goldschmidt Corp., Th.

Safety Devices
(See Life Saving Devices)

Sanitary Fittings
(See Plumbing)

Scales
Fairbanks, Morse & Co.

Seamless Steel Tubes
National Tube Co.

Searchlights
Sperry Gyroscope Co.

Sentinel Valves
(See Valves)

Separators, Oil
Babcock & Wilcox Co., The
De Laval Separator Co.
Sharples Specialty Co., The

Shafting
(Seamless Steel)
Kearfott Engineering Co.
National Tube Co.

Shafting—Bronze
Chase Metal Works
Scovill Mfg. Co.

Sheets, Brass
American Brass Co.
Chase Metal Works
Scovill Mfg. Co.

Sheets, Monel Metal and Nickel
International Nickel Co.

Shipbuilders and Dry Dock Companies
Bethlehem Shipbuilding Corp.
Charleston Dry Dock & Machine Co.
Cramp & Sons S. & E. Building Co., The Wm.
Federal Shipbuilding and Dry Dock Co.
Morse Dry Dock & Repair Co.
New London Ship & Engine Co.
New York Shipbuilding Corp.
Standard Motor Construction Co.
Staten Island Shipbuilding Co.
Sun Shipbuilding & Dry Dock Co.
Tickle Engineering Works, Arthur
Todd Shipyards Corp.

Ship Brokers
Ferris, Theodore
Watts, J. Murray

Ship Clocks
(See Clocks)

Ship Compositions
Briggs Bituminous Composition Co.
Walles Dove-Hermiston Corp.

Ship Fittings, Supplies and Equipment
Griscom-Russell Co.

Ship Glue
(See Marine Glue)

Ship Repairs
(See Dry Docks and Marine Railways)

Ship Stabilizers
Sperry Gyroscope Co.

Ship Upholstery
Pantasote Co., The

Shipyards
(See Shipbuilders)

Shipyard Cranes
(See Cranes)

Shipyard Whirlers
(See Cranes)

Silencers, Marine Engine
Maxim Silencer Co., The

Shop Cranes
(See Cranes)

Skylight, Lifting Gear
Tiebout, W. & J.

Slings, Wire Rope
Roebling's Sons Co., J. A.

Slotting Machines
Martindale Electric Co.

Steam Engines
(See Engines)

Steam Hoists
(See Hoisting Engines)

Steam Hose
Ingersoll-Rand Co.

Steam Pumps
(See Pumps)

Steam Separators
Crane Co.
Griscom-Russell Co.

Steam Traps
American Schaeffer & Budenberg Corp.
Crane Co.
Griscom-Russell Co.

Steam Turbines
Bethlehem Shipbuilding Corp.
Capstaff-Hunter Turbine Works, Inc.
Cramp & Sons S. & E. Building Co., The Wm.
De Laval Steam Turbine Co.
General Electric Co.
Kearfott Engineering Co.
Sturtevant Co., B. F.
Westinghouse Electric & Mfg. Co.

Steam Turbine Dynamos
De Laval Steam Turbine Co.
General Electric Co.
Kearfott Engineering Co.
Westinghouse Electric & Mfg. Co.

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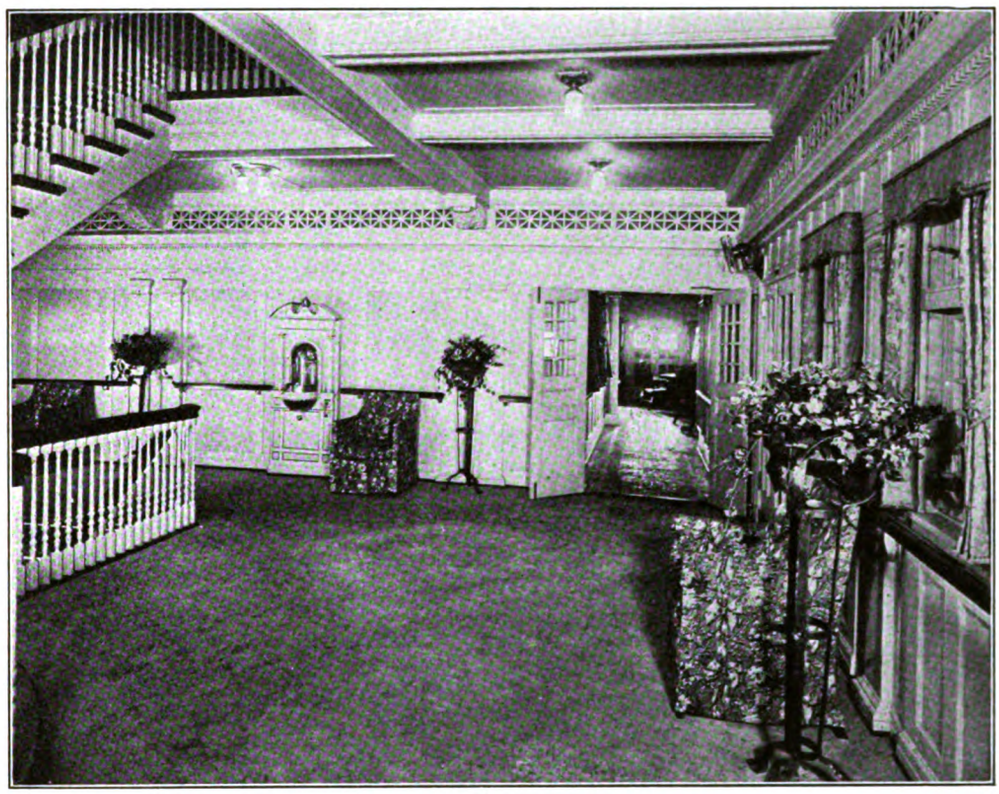
LUXURY REFINEMENT

Vehisote
"TRADE MARK"



"Vehisote" is a scientifically manufactured **waterproof fiber board.**

Vehisote, like steel, is made by a fluxing process in which all the fibers run together, interlock and interlace so that it becomes all one homogeneous mass—in which there is no point of separation, no grain as in wood, no laminations as in built-up or stuck together products.

The Pantasote Company
NEW YORK

Peoples Gas Building, Chicago — Penobscot Building, Detroit
Scovel Iron Store Co. or Waterhouse & Lester, San Francisco.

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Steel Castings
(See Castings, Steel)

Steel, Firebox
Lukens Steel Co.

Steel Pipe
Crane Co.
National Tube Co.

Steel Shafting
(See Shafting)

Steering Engines
American Engineering Co.
Hyde Windlass Co.
Kearfott Engineering Co.
Lidgerwood Mfg. Co.

Steering Gears
American Engineering Co.
Bethlehem Shipbldg. Corp.
Hyde Windlass Co.
Lidgerwood Mfg. Co.

Steering Wheels
American Engineering Co.
Hadfield-Penfield Steel Co.
Hyde Windlass Co.

Stones, Commutator
Martindale Electric Co.

Stop Cocks
(See Valves)

Storage Batteries
(See Batteries, Storage)

Stoves, Cabin Heating
Stamford Foundry Co.

Superheaters
(See Marine Superheaters)

Superheater Tubes
National Tube Company

Surface Condensers
Capstaff-Hunter Turbine Works, Inc.
Davidson Co., M. T.
Ingersoll-Rand Co.
Wheeler Mfg. Co., C. H.

Switches and Switchboards
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Tachometer, Magneto
Weston Electrical Instrument Co.

Tackle Blocks
Marine Decking & Supply Co.

Tail Shafts
(See Shafting)

Tank Pumps
Davidson Co., M. T.
Ingersoll-Rand Co.
Warren Steam Pump Co.

Tanks
(Copper, Galvanized Iron)
Fairbanks, Morse & Co.
Griscom-Russell Co.
International Nickel Co.

Tanks, Seamless Steel
Continental Iron Works, The
National Tube Co.

Tanks, Welded Steel
Continental Iron Works, The

Telegraph Apparatus and Telegraphs—Mechanical
(See Mechanical Telegraphs)

Telegraph Fittings and Voice Tubes and Fittings
Tiebout, W. & J.

Telemotors — Electric and Hydraulic
American Engineering Co.
Hyde Windlass Co.

Telltale Board, Running Light
General Electric Co.

Thermometers
American Schaeffer & Budenberg Corp.

Tiling
Keystone Solether Co.

Tiller Rope
Roebling's Sons Co., J. A.

Timber
McKenna, Inc., J. F.

Toasters, Electric
Edison Electrical Appliance Co., Inc.

Tools, Machine
(See Machine Tools)

Torches, Oxy-Acetylene
Air Reduction Sales Co.

Towing Hooks and Cocks
American Engineering Co.

Towing Lines
(See Rope and Wire Rope)

Towing Machines
American Engineering Co.
Lidgerwood Mfg. Co.

Transmission Rope
(See Rope)

Traps
(See Steam Traps)

Traveling Cranes
(See Cranes)

Tubes
(See Boiler Tubes; also Condenser Tubes)

Tubes, Seamless
American Brass Co.

Tubes, Rods, Wires
(Copper, Brass and Bronze)
Chase Metal Works
Scovill Mfg. Co.

Tube Cleaners
(See Boiler Flue Cleaners)

Tugs
(See Shipbuilders)

Turbines
(See Steam Turbines)

Turnbuckles and Other Wire Rope Accessories
American Engineering Co.

Twine
(See Rope, also Cordage)
Columbia Rope Co.
Plymouth Cordage Co.

Unions
(See Pipe Fittings)

Upholstery
(See Ship Upholstery)

Urn Heaters
Edison Electrical Appliance Co., Inc.

Vacuum Gauges
(See Gauges, Steam)

Vacuum Pumps
Davidson, M. T., Co.
Ingersoll-Rand Co.
Warren Steam Pump Co.
Westinghouse Electric & Mfg. Co.
Wheeler Mfg. Co., C. H.
Worthington Pump & Machinery Corp.

Vacuum Traps
Crane Co., The
Griscom-Russell Co.

Valve Discs
Reading Steel Castings Co.

Valve Reseating Machines
Leavitt Machine Co.

Valves
American Schaeffer & Budenberg Corp.
Atlas Valve Co.
Bethlehem Shipbldg. Corp.
Crane Co.
Griscom-Russell Co.
Jenkins Bros.
Jerguson Valve Mfg. Co.
Lunkenheimer Co.
Powell Co., The William
Reading Steel Casting Co., Inc.

Valves, Ammonia and Carbon Dioxide
Frick Co.
York Mfg. Co.

Valves, Angle
Cleveland Pneumatic Tool Co.
Crane Co.
Lunkenheimer Co., The
Powell Co., The William
Reading Steel Casting Co., Inc.

Valves, Blow-Off
Crane Co.
Lunkenheimer Co., The
Powell Co., The William
Reading Steel Casting Co., Inc.

Valves, By-Pass
Crane Co., The
Griscom-Russell Co.
Lunkenheimer Co., The
Powell Co., The William
Reading Steel Casting Co., Inc.

Valves, Cast Steel
Reading Steel Casting Co., Inc.

Valves, Check, Brass and Iron
Crane Co.
Lunkenheimer Co., The
Powell Co., The William
Reading Steel Casting Co., Inc.

Valves, Float
Atlas Valve Co.
Crane Co.

Valves, Gate, for Tank Steamers
Reading Steel Casting Co., Inc.

Valves, Gate—Brass and Iron
Crane Co., The
Lunkenheimer Co., The
Powell Co., The William
Reading Steel Casting Co., Inc.

Valves, Globe—Brass and Iron
Crane Co., The
Lunkenheimer Co., The
Powell Co., The William
Reading Steel Casting Co., Inc.

Valves, Governor
Atlas Valve Co.
Crane Co.
Lunkenheimer Co., The

Valves, Monel Metal
International Nickel Co.

Valves, Pump
International Nickel Co.

Valves, Reducing
Atlas Valve Co.
Crane Co.
Lunkenheimer Co., The

Valves, Regulating
Atlas Valve Co.
Crane Co.
Lunkenheimer Co.
Powell Co., The William

Valves, Relief
American Schaeffer & Budenberg Corp.
Atlas Valve Co.
Crane Co.
Lunkenheimer Co.
Powell Co., The William

Valves—Rubber
Powell Co., The William

Valves, Safety
American Schaeffer & Budenberg Corp.
Crane Co.
Lunkenheimer Co.
Powell Co., The William

Valves, Stop
Reading Steel Casting Co., Inc.

Valves—Water
Crane Co.
Jerguson Gage & Valve Co.
Lunkenheimer Co.
Powell Co., The William
Reading Steel Casting Co., Inc.

Valve Wheels, Chain
Reading Steel Casting Co., Inc.

Ventilating Fans
(See Blowers)

Ventilators
Sturtevant Co., B. F.

Ventilating Sets
Buffalo Forge Co.
Sturtevant Co., B. F.

Vertical Pumps
(See Pumps)

Vessel Brokers
(See Ship Brokers)

Voice Tubes and Fittings
Chase Metal Works
Cory & Son, Inc., Chas.

Wainscoting
Pantasote Co., The

Water Closets, Marine
(See Marine Plumbing)

Water Columns
Crane Co.
Jerguson Gage & Valve Co.
Lunkenheimer Co.
National Tube Co.

Water Gages and Alarms
Crane Co.
Jerguson Gage & Valve Co.
Lunkenheimer Co.
Powell Co., The William

Waterproofing
Briggs Bituminous Composition Co., Inc.

Welding
Metal & Thermit Corp.

Welding, Acetylene
Capstaff-Hunter Turbine Works, Inc.

Welding, Thermit
(See Thermit Welding)

Welding and Cutting Apparatus and Supplies
(Oxy-acetylene Process)
Air Reduction Sales Co.
Metal & Thermit Corp.

Welding—Electric
Capstaff-Hunter Turbine Works, Inc.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Welding Metals
(See Welding and Cutting Apparatus and Supplies)

Welding Rods
Air Reduction Sales Co.
American Brass Co.
Cramp & Sons S. & E. Building Co., The Wm.
Roebling's Sons Co., J. A.

Wharf Cranes
(See Cranes)

Wharf Drops
American Engineering Co.

Whistle Control
Tiebout, W. & J.

Whistles
American Schaeffer & Budenberg Corp.
Crane Co.
Lunkenheimer Co.
Powell Co., The William

Whistles, Air
American Strombos Co., Inc.

Winches
(See Windlasses)
Bethlehem Shipbldg. Corp.
Standard Steam Winch & Hoist Co.
Westinghouse Elec. & Mfg. Co.

Windlasses
American Engineering Co.
Bethlehem Shipbldg. Corp.
Hyde Windlass Co.
Kearfott Engineering Co.
Lidgerwood Mfg. Co.
Westinghouse Elec. & Mfg. Co.

Wire, Brass
American Brass Co.
Chase Metal Works
Scovill Mfg. Co.

Wire Rope, Cables and Accessories
American Engineering Co.
International Nickel Co.
Page Steel & Wire Co.
Roebling's Sons Co., J. A.

Wiring Devices
(See Marine Wiring Devices)

Woodworking Machinery
Chicago Pneumatic Tool Co.
Cleveland Pneumatic Tool Co.
Ingersoll-Rand Co.

Wrecking Cables
Columbian Rope Co.
Plymouth Cordage Co.

Wrecking Pumps
Davidson Co., M. T.
Warren Steam Pump Co.

Yacht Brokers
(See Ship Brokers)

Yachts
(See Shipbuilders)

Zinc Oxide
New Jersey Zinc Co.

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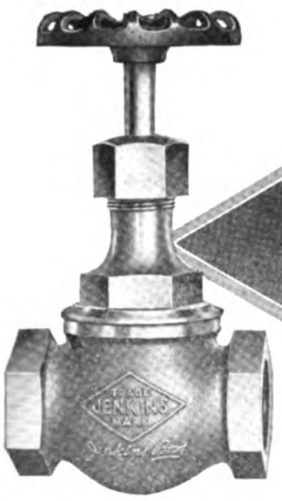
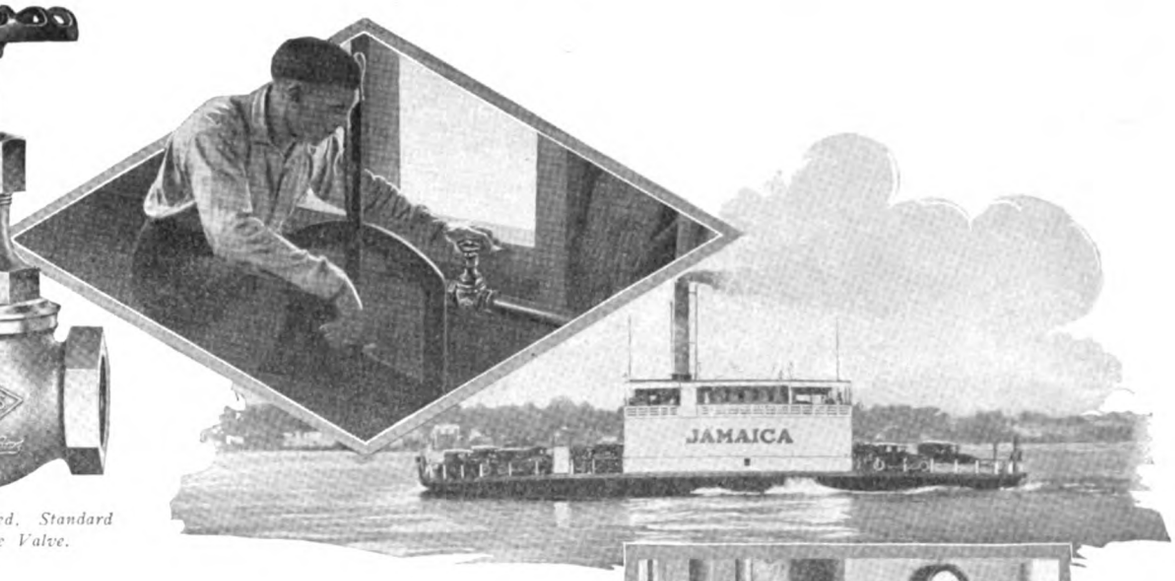


Fig. 106, screwed, Standard Bronze Globe Valve.



On the Niagara River

Bucking a nine mile an hour current on the Niagara River, the Jamaica, a sturdy model of shipbuilder's art in the early 80's, ferries passengers and automobiles between Buffalo and Ontario.

Jenkins Valves play their part on this ferry and have for years, even when this same boat plied the harbor of New York City.

Jenkins Valves are made for practically all marine and shipbuilding requirements, in bronze and iron, standard, medium and extra heavy patterns. They are valves that prove their economy by years of service.

Real Jenkins service can only be secured from Jenkins Valves—insist on the Jenkins Diamond Trade Mark.

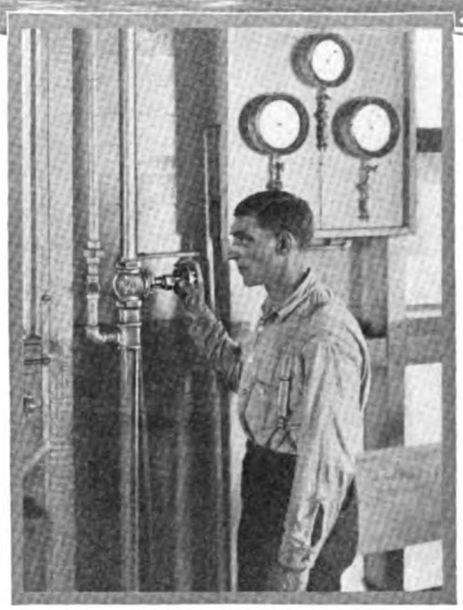


Fig. 705, Jenkins Marine Globe Valve.

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The steady increase of tonnage handled at Port Newark is the logical result of the necessity for quicker clearance of cargoes through the gateway port of New York.

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Port Newark offers unusual opportunities for the alert shipping executive. New enterprises are constantly being attracted by the unique advantages that it affords them. Terminal sites that may now be acquired on most reasonable terms will soon be unattainable. For your own information, get all the facts about Port Newark now. Write for the free comprehensive book "PORT NEWARK" that tells the whole story of this remarkable development.

THOS. L. RAYMOND, Director
Department of Public Works :: Newark, New Jersey

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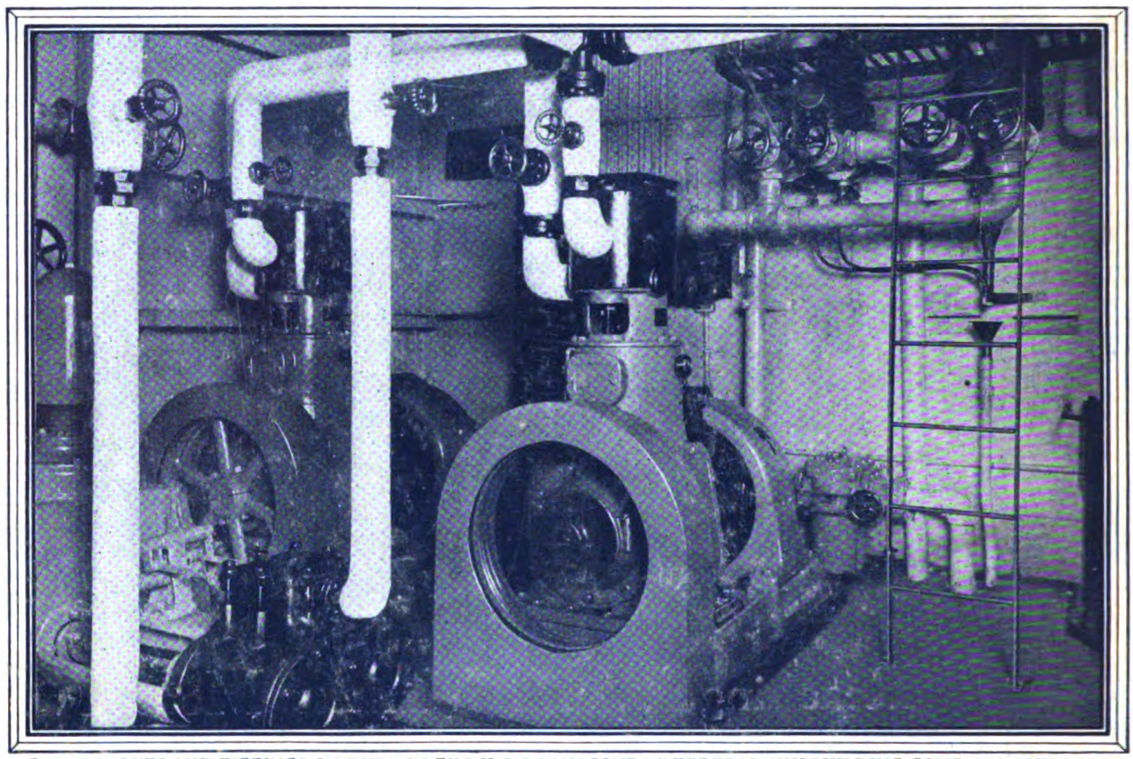

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